# B.C. HYDRO

## SKEENA – KITIMAT 287kV TRANSMISSION LINE
## ENVIRONMENTAL STUDIES

## LAND USE / SOCIO – ECONOMIC COMPONENT

B.C. HYDRO

# SKEENA-KITIMAT 287 kV TRANSMISSION LINE PROJECT

## ENVIRONMENTAL ASSESSMENT
## LAND USE/SOCIO-ECONOMIC COMPONENT

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# EXECUTIVE SUMMARY

## 1. INTRODUCTION

### 1.1 Background

B.C. Hydro has identified the need to reinforce the existing transmission system between the Skeena substation, near Terrace, and the Kitimat substation. Preliminary coordination and purchase agreements between B.C. Hydro and Alcan are a significant factor in the need for system reinforcement. In addition, the proposed Skeena-Kitimat 287 kV transmission line will provide a degree of stability should the existing transmission line be out of service.

In order to construct the proposed Skeena-Kitimat 287 kV transmission line, B.C. Hydro must apply to the B.C. Utilities Commission for a Certificate of Public Convenience and Necessity. As part of this application, engineering and environmental studies must be completed. The intention of this report is to complete the land use/socio-economic component of the required environmental studies.

### 1.2 Terms of Reference

The Terms of Reference for the land use/socio-economic component of the project required existing land uses, land status and tenure, development plans, potential conflicts and mitigative measures along proposed Routes 'A', 'B' and 'AB', be examined. These Terms of Reference were amended in the latter stages of the assignment to include a brief examination of the possibility of utilizing double circuit structures on either Route 'A' or 'B'. In addition, impacts of construction on settlements and residents in the study area were to be identified.

## 2. METHODOLOGY AND ASSUMPTIONS

### 2.1 Work Program

Steps involved in the work program included a project orientation meeting, data and information collection, preliminary documentation, consultation with the project team and preparation of project report and maps.

## 2.2 Information Sources

Existing map series, municipal and regional government representatives, provincial government agencies and others were drawn from to supplement field information gathered.

## 2.3 Methods

The status of lands within the study area were established through accessing information contained in the Ministry of Crown Lands' computer data base. The analysis of land use focussed on the examination of residential, commercial, industrial and related land uses in the study area. Development plans were documented from discussions with local and provincial government agency representatives and others. Water licence information was obtained from Ministry of Environmental Water Rights maps and stream registers.

Detailed project information was obtained from B.C. Hydro's transmission engineering division. Employment, accommodation and income impacts were determined by comparing existing conditions within communities in the Terrace-Kitimat area with employment and spending expected to be generated by the proposed project. Community impacts were documented by reviewing comments made during the data collection phase of the assignment, and by examining the results of the public consultation process.

Factors considered when assessing potential conflicts included proximity of proposed routes to areas of settlement and development, privately owned and tenured land and water sources. In addition, inmigration to communities, availability of accommodations and other community impacts were reviewed.

# 3. LAND STATUS AND USE

## 3.1 General Description

The proposed routes traverse the broad valley lying between the City of Terrace, located on the Skeena River, and the District of Kitimat, located at tidewater at the end of the Douglas Channel. Proposed Route 'A' cuts across this broad valley south of Terrace before traversing across predominantly low lying, swampy terrain on the eastern side of the valley. Route 'A' then crosses the Kitimat River to join proposed Route 'B' in Kitimat. Proposed Route 'B' runs along the foot of steep slopes descending from the Kitimat Ranges of the Coast Mountains to the west before joining Route 'A'. The final

stages of this proposed transmission route lie on the slopes to the west of the Kitimat River, descending sharply from these slopes to the Kitimat substation at the line's southern terminus. Major water bodies in the area include Lakelse Lake, the Kitimat, Lakelse and Wedeene Rivers and several other smaller creeks plunging from the mountain slopes bordering the valley. Access to these proposed transmission routes is provided by the Terrace-Kitimat Highway (Highway 97), Beam Station Road south of Terrace and the network of resource roads extending from these main roads.

## 3.2 Land Status

The proposed transmission routes pass over land which is primarily Crown-owned. Clusters of privately owned land are located in the vicinity of the Skeena substation, surrounding Lakelse Lake, in the Humphreys Creek/McCullough Creek area and within the District of Kitimat. There are several Indian Reserves in the area, notably on the Lakelse River and east of the proposed route within the District of Kitimat. Other important aspects of land status and tenure include numerous Crown reserves (sand and gravel reserves, reserves for the use, recreation and enjoyment of the public, reserves set aside on behalf of the Ministries of Forests and Regional and Economic Development), Lakelse Lake Provincial Park, the Pacific Northern Gas pipeline rights-of-way on the eastern side of the valley and the location of Agricultural Land Reserve areas throughout the valley.

## 3.3 Land Use

In the context of residential, commercial, industrial and related land uses, much of the land through which the proposed routes pass is unused land. Areas where substantial land uses exist include:

- surrounding Lakelse Lake, where some 300 parcels are used for residential, recreational, commercial and related purposes;

- within the District of Kitimat near the line's southern terminus, where light industrial and large manufacturing facilities are located in close proximity to the proposed transmission route.

In addition, several utilities and transportation corridors are located near the proposed routes. Route 'A' runs roughly parallel to existing transmission lines, pipelines and Highway 37 over much of its length. Route 'B' is in close proximity to the CN Railway. The combined routes parallel an existing transmission line.

## 3.4 Development Plans

Various developments have been proposed for the valley between Terrace and Kitimat. These include:

- additional residential/recreational development around Lakelse Lake. This development will be limited to infilling in existing subdivisions;
- a proposal to expand the commercial/recreational facilities located at the Mount Layton Hot Springs Resort;
- possible development of three major industrial sites in the valley (Thunderbird, Dubose and Wedeene sites); and
- long term objective of the Ministry of Transportation and Highways to upgrade Highway 37 and other roads in the valley.

## 3.5 Water Licences

Along proposed Route 'A', there are 20 water sources licenced for water supplies. Forty-two licencees withdraw water from these sources for domestic, conservation, irrigation, waterworks, storage, industrial, land improvement and mineral trading (hot springs) purposes. Multiple licences exist on Lakelse Lake, Hatchery Creek, Edward Creek and Crystal Creek. No water licences exist along proposed Route 'B'. At the southern terminus of the proposed transmission route, where Routes 'A' and 'B' are combined, Kentron Construction Ltd. withdraws water from the Kitimat River for industrial use, and Alcan and Eurocan Pulp and Paper withdraw water from Anderson Creek for industrial and waterworks purposes.

## 3.6 Potential Conflicts and Mitigative Measures

Potential conflicts which may result from construction of the proposed transmission line include:

- disruption of Pacific Northern Gas pipeline rights-of-way;
- disturbance of extraction of sand and gravel from active Ministry of Transportation and Highways reserves;
- disruption of water intakes and water sources by construction activities; and
- general disturbance or residential, recreation and commercial land uses in the area.

Steps which may be taken to mitigate these potential conflicts include:

- cooperate with Pacific Northern Gas to identify the exact location of their rights-of-way and utilities and to ensure that B.C. Hydro's proposal is coordinated with these rights-of-way;

- ensure that tower placement does not restrict use of existing sand/gravel pits or limit access to future sand/gravel resources;

- carefully locate water intake structures and ensure that these intakes and the sources from which they draw are not disturbed during construction. Hand clearing of vegetation may be necessary in some instances, as may the retention of a buffer strip of vegetation to minimize siltation of the water source; and

- in general, minimize the noise, traffic and other disruptive factors associated with construction in order to reduce disturbance of land uses in the area.

## 4. COMPARISON OF ROUTE OPTIONS

Considerable variation exists in the status and use of lands in the vicinity of the two proposed routes. As a consequence, the impacts which would result from the selection of Route 'A' for single or double circuit transmission lines differ substantially from the impacts which would result if Route 'B' were chosen.

From the perspective of land status and use, Route 'B' would be more acceptable than Route 'A' for the installation of a single circuit transmission line. This conclusion is based on the fact that the selection of Route 'A' would result in substantially more negative impacts (eg. need for wider right-of-way, disruption of various Crown reserves, number of private parcels traversed, proximity to areas of extensive development) than Route 'B', while Route 'B' has relatively more positive features associated with it (eg. right-of-way entirely on Crown land, no substantive development in vicinity, Route in close proximity to proposed industrial sites).

Should the decision be taken to utilize double circuit arrangements, Route 'A' would be more acceptable than Route 'B' from the land status/use perspective. The ability to use a well established right-of-way in an existing utility corridor was a key factor in reaching this conclusion. Also of paramount importance is the fact that most of the negative impacts associated with the use of Route 'A'

for a single circuit arrangement are not applicable here, as a new right-of-way would not be required. Other important considerations include the incremental nature of any impacts which may result, and the lack of benefits which would result from the release of the existing 2L99 right-of-way.

## 5. SOCIO-ECONOMIC IMPACTS

### 5.1 Project Information

The estimated cost of the proposed project is $16-18 million. Phases involved in construction of the proposed project would include surveying/forestry, relocation of the 2L103 transmission line at Kitimat, right-of-way clearing, transmission line construction, civil construction/electrical installation at the Skeena substation and right-of-way restoration. The total elapsed time required to complete the seven phases is expected to be five years, from 1991 through 1995. The type and degree of specialization of skills varies with phases of the project. Right-of-way clearing and restoration phases do not require highly specialized workforces. All other phases require a relatively higher degree of specialization among their workforces.

### 5.2 Characteristics of Communities Along Proposed Transmission Routes

Approximately 23,000 people live in the vicinity of the Skeena and Kitimat substations and along the proposed transmission routes. Manufacturing of resource products, utilizing the region's abundant energy resources, is the basis of the area's economy. Financial and related services, public administration, trade and related services are also significant components of the area's economy. Primary activities (logging, mining) are important to the Terrace economy, yet much less so in Kitimat. The average rate of unemployment is approximately 6%. Among the unemployed is a substantial pool of forestry/logging, construction trades/occupations, equipment operation and other labour which may be able to participate in transmission line construction. In addition, various types of contractors with skills and experience relevant to various phases of transmission line construction are located in the area, principally in Terrace. Economic development initiatives in the area are focussed on enhancing the trade/service sector of the economy and bringing additional heavy industry into the area. The attitudes toward growth in the area appear to be in favour of fostering diversification and strengthening existing industries in an environmentally sound manner.

## 5.3 Socio-Economic Impacts

Direct employment during the peak of the ground surveying and line relocation phases of construction, projected to take place between 1991-1992, will be in the order of ten positions. The level of direct employment during the right-of-way clearing and transmission line phases of construction will rise to approximately 40. These phases are projected to occur between 1993-1994. Alterations to the Skeena substation and restoration of the right-of-way, scheduled to take place between 1994-1995, will employ a peak workforce of 5-10 people. Indirect/induced employment generated will mirror these trends, with the greatest amount of such employment occurring during the right-of-way clearing and transmission line construction phases. As a considerable portion of the required workforce is available in the area, substantial inmigration can be expected only during those phases of construction which require specialized labour and contractors.

The use of local hotel/motel, recreation vehicle site and other accommodations will be greatest during those phases of construction requiring specialized labour and contractors, as this workforce will be drawn from outside of the area. Ample accommodations exist in the area to house this inmigrant workforce. In addition, these accommodations are located within reasonable commuting distance of all work sites along the proposed transmission routes. Therefore, the need for construction camps is not anticipated.

There are two major components of income effects associated with a project of this nature - wages earned from direct and indirect/induced participation in the project, and expenditures on materials. The local area will derive greatest benefit from direct and indirect/induced wages during less specialized phases of construction, when local labour participation is highest. The local area will also realize the most substantial income effects from the purchase of construction and other materials during the less specialized phases of construction, when most required materials are available locally.

A number of socio-economic issues have been raised by people living in the Terrace-Kitimat area. These include the desire to secure local employment opportunities, the possibility of bringing long term benefits to the area and the need to ensure that construction contracts are of a size manageable by small firms. B.C. Hydro should be aware of these issues in order that local benefits may be maximized.

Construction projects such as that proposed by B.C. Hydro are transitory in nature. It follows, therefore, that any socio-economic benefits associated with this proposed project will also be transitory in nature. Furthermore, the magnitude of the construction workforce for the proposed project is not large in the context of the overall labour force in the Terrace-Kitimat area. There are, however, opportunities for the area to benefit from the proposed income effects (wages and material purchases) of the project. It is therefore important that B.C. Hydro, its contractors and the local communities work closely together to ensure maximum economic benefits accrue to the local area during construction, and that disruptions to community life are minimized.

## 1.1 BACKGROUND TO THE STUDY

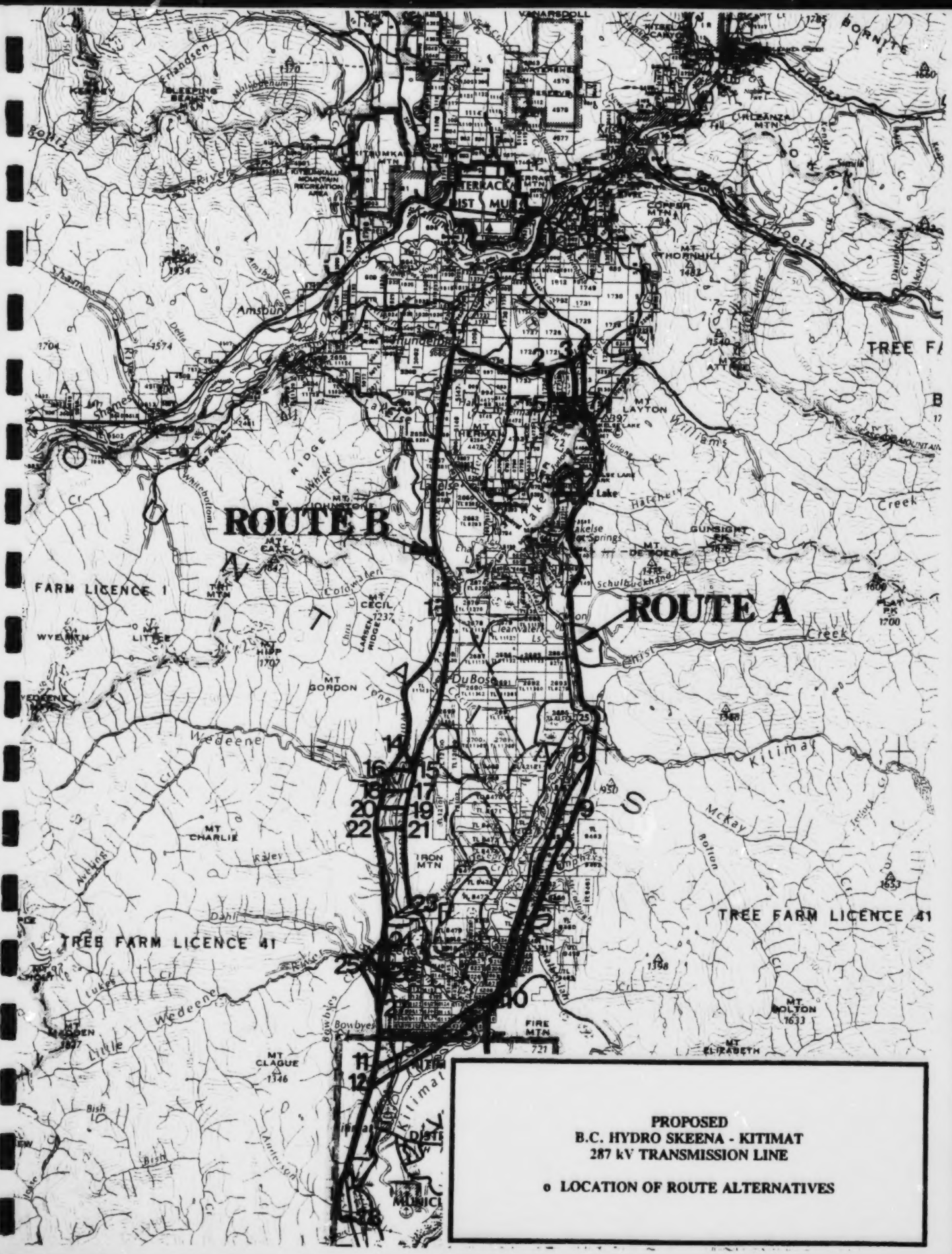
B.C. Hydro has identified the need to reinforce the existing transmission system between the Skeena substation, near Terrace, and the Kitimat substation, within the District of Kitimat (see Map 1.1). In order to reinforce the transmission system, B.C. Hydro proposes to construct a 287 kV transmission line between these two substations. There are two significant reasons why this transmission line is necessary. First, B.C. Hydro and Alcan have reached preliminary coordination and purchase agreements for a total of up to 800 megawatts that could be transmitted into the B.C. Hydro system. The energy will come from Alcan's Kemano Completion Project, scheduled for service in 1994. Second, the proposed transmission line will provide a degree of stability in case the existing transmission line was out of service.

In order to construct the proposed Skeena-Kitimat 287 kV transmission line, B.C. Hydro must apply to the B.C. Utilities Commission for a Certificate of Public Convenience and Necessity. As part of this application, environmental and engineering studies must be completed. One component of the environmental studies associated with the proposed transmission line is the assessment of land use/socio-economic resources and potential impacts. The intention of this portion of the environmental studies for the proposed project is to complete that assessment.

## 1.2 TERMS OF REFERENCE

The Terms of Reference for the land use/socio-economic component of the project called for the following:

- determine and map existing land uses within the study areas outlined for proposed Routes 'A' and 'B';
- describe and map land status and tenure within the study areas outlined for proposed Routes 'A' and 'B';
- determine development plans of local governments, provincial government agencies and Indian Bands;
- identify potential land use conflicts;


ROUTE B
ROUTE A
FARM LICENCE 1
TREE FARM LICENCE 41
TREE FARM LICENCE 41
PROPOSED
B.C. HYDRO SKEENA - KITIMAT
287 kV TRANSMISSION LINE
o LOCATION OF ROUTE ALTERNATIVES

- identify the impacts of the construction workforce on settlements and residents in the study area;

- suggest measures to mitigate conflicts and enhance benefits to local communities; and

- work in close cooperation with other members of the environmental studies team.

The Terms of Reference were amended in the latter stages of this assignment to include a brief examination of the possibility of utilizing double circuit structures on either Route 'A' or 'B'. This amendment was a direct result of requests from the public and provincial government Ministries, who felt that there may be merit in placing the existing 287 kV transmission line (2L99) and the proposed 287 kV transmission line (2L104) in a common right-of-way on double circuit structures.

## 1.3 PROJECT TEAM

Two members of Urban Systems Ltd.'s staff were involved in this project. They were:

- G. Petersen, M.A., M.C.I.P. - project management and liaison with B.C. Hydro; and

- J. Dumbrell, M.A. - project researcher/analyst and principal author of report.

## 1.4 ACKNOWLEDGMENTS

Numerous people provided direct input to this study. They included:

- M. Walmsley - B.C. Hydro Skeena-Kitimat Project Environmental Studies Coordinator;

- G. Barnett - Transmission Engineering, B.C. Hydro; and

- various local and provincial government agency representatives. A complete list of those representatives is attached in Appendix I.

In addition, the cooperation of other members of the Skeena-Kitimat Environmental Studies Team is gratefully acknowledged.

## 1.5 REPORT STRUCTURE

The remainder of the report is structured into three sections. They are:

Section 2 - Methodology and Assumptions

The work program followed, information sources utilized and methods and assumptions used in the study are reviewed in this section.

Section 3 - Land Status and Use

The proposed transmission routes have been divided into segments for reporting purposes. Within each of these segments land status and use, development plans, water licences, potential conflicts and suggested mitigative measures are reviewed.

Section 4 - Comparison of Route Options

The potential positive and negative impacts associated with proposed Routes 'A' and 'B' are discussed, with the intent of identifying the most acceptable route from the land status/use perspective. Utilization of these proposed Routes for single and double circuit transmission line arrangements are considered.

Section 5 - Socio-Economic Impacts

This section is separated into three main components. Project information, including construction cost, timing and phasing, is discussed. Characteristics of communities along the transmission route such as population, economic base and attitudes toward growth, are reviewed. Finally, the social and economic impacts anticipated to result from the project are identified. These impacts include employment, accommodation, income and other community impacts.

## 2.1 INTRODUCTION

This section discusses the methodology and assumptions used in undertaking the land use/socio-economic component of the environmental studies program for the proposed Skeena-Kitimat 287 kV transmission line. A review of the work program followed, information sources drawn from and methods and assumptions used in analyzing and documenting the information is included.

## 2.2 WORK PROGRAM

### 2.2.1 Project Initiation

A meeting was held with representatives from B.C. Hydro, the Skeena-Kitimat Project Environmental Studies Coordinator and other members of the Environmental Studies Project Team to discuss the background to the study, review existing information, project timing and other logistics.

### 2.2.2 Data Collection

The data collection phase of the work program consisted of two main tasks. First, the proposed transmission corridors were reconnoitered by air and land in order to document existing land uses. Second, a series of meetings with municipal and regional governments, provincial government agencies and others was held to review land status and use, development plans, potential conflicts and other items.

### 2.2.3 Preliminary Documentation

This phase of the work program involved preparation of the map series depicting land status and use, development plans and other features, and the documentation of points along the proposed transmission corridors where potential conflicts may occur.

### 2.2.4 Consultation with Project Team

A meeting was held with the Project Coordinator and other members of the Project Team to review progress, discuss preliminary findings and exchange information of mutual interest.

### 2.2.5 Preparation of Project Report

The final stage in the work program involved the preparation of this report and the accompanying map series.

Through all phases of the work program, close attention was paid to documenting and reporting on issues and concerns raised by the public. Public input was received during both the data collection phase of the work program, and as a result of the public consultation process undertaken in cooperation with the environmental studies program. Input from the public, coupled with comments received from various provincial government Ministries, was a significant factor in the decision to examine the possibility of installing double-circuit transmission line structures on Routes 'A' and 'B'.

## 2.3 INFORMATION SOURCES

The number of information sources is too numerous to list here. They include existing map series, municipal and regional government representatives, provincial government agencies and other sources. A complete list of information sources used is attached in Appendix I.

## 2.4 METHODS AND ASSUMPTIONS

Outlined below are they key methods and assumptions used in analyzing and documenting land status and use, development plans and water licence information and socio-economic characteristics of communities, along with potential conflicts and impacts which may result from construction of the transmission line.

### 2.4.1 Land Status

The status of lands within the study area were established through accessing information contained in the Ministry of Crown Lands' computer data base. This information included details on land ownership (eg: Crown-owned, private) and land tenure (eg: Crown reserves, map notations, Crown leases).

### 2.4.2 Land Use

Following documentation of existing land uses during the data collection phase of the assignment, this land use information was analyzed. In board terms, the analysis examined residential, commercial, industrial and related land uses within the study area.

### 2.4.3 Development Plans

Interviews with local and provincial government representatives and others provided an indication of development plans.

### 2.4.4 Water Licences

Information derived from Water Rights maps and stream registers maintained by the Ministry of Environment was used to document water licences. Only those licences which lay within or in close proximity to the transmission corridor were documented.

### 2.4.5 Project Information

Detailed project information obtained from B.C. Hydro on construction cost, timing and phasing was utilized to provide a basis for assessing the social and economic impacts of the project.

### 2.4.6 Social and Economic Impacts

#### .1 Employment

Availability of labour and contractors to participate in transmission line construction was established through analyzing the labour market in the Region. Direct and indirect/induced employment opportunities generated were estimated using workforce requirements from B.C. Hydro. Workforce inmigration was estimated by comparing the available workforce with the required workforce.

#### .2 Accommodation

The availability of accommodations was determined from publications of the Ministry of Tourism and discussions with regional tourism agencies. The demand for these accommodations was estimated by utilizing anticipated workforce inmigration.

.3 Income

As detailed cost information was not available, only general comments have been made regarding income impacts. These comments are based on the types of goods and services required during transmission line construction, and the availability of these goods and services in the communities along the transmission corridor.

.4 Community Impacts

Potential community impacts were documented by reviewing comments made during the data collection phase of this assignment, and by examining the results of the public consultation process.

2.4.7 Potential Conflicts and Impacts

The following factors were considered when assessing potential conflicts and impacts:

- proximity of the proposed routes to rights-of-way, reserves and other types of land status and tenure;
- disruption to settled areas as a result of construction activity;
- disruption to water sources and intakes as a result of construction;
- inmigration to communities;
- possible shortages of accommodations;
- spending generated; and
- other community impacts.

## 3.1 INTRODUCTION

This section describes the status and use of land within the study area defined for the Skeena-Kitimat 287 kV transmission line project. The discussion is structured into three broad subsections which correspond with the three routes outlined within the study area. These three subsections are further subdivided into the following nine segments:

Route A:
- .1 Nodes 1-2-3-4-5-6-7;
- .2 Nodes 7-8;
- .3 Nodes 8-10, 8-9-10; and
- .4 Nodes 10-11, 10-12.

Route B:
- .1 Nodes 1-13;
- .2 Nodes 13-14;
- .3 Nodes 13-15; and
- .4 Nodes 14/15-11/12, including various subsegments.

Route AB:
- .1 Nodes 11/12-28

These nine segments do not correspond exactly with the 23 segments contained within the Skeena-Kitimat study area. It was not felt to be necessary to treat each of the 23 segments separately as, in many cases, there was little to differentiate one segment from the other in terms of land status and use. Included within the review of each of the nine segments are the following:

- a general description of terrain, water courses and access;
- a review of land status. This review includes comments on land status (eg: Crown-owned or private) as well as tenures which exist on Crown-owned lands (eg: reserves for sand and gravel extraction, reserves for the use, recreation and enjoyment of the public);

- description of land use. The focus of this description is residential, industrial, commercial, institutional and related forms of land use. Resource uses such as forestry and wildlife harvesting are not discussed as other sections of the environmental studies report deal more specifically with these topics;

- review of development plans. Planned industrial developments, provincial government Ministry initiatives and proposed commercial developments are all examples of development plans which are reviewed;

- identification of water sources licenced for water supply. The location and intended use of these water licences are identified. More detailed information on these licences is included in Appendix II; and

- potential conflicts and suggested mitigative measures. Potential conflicts between land use, development plans or water licences and the proposed construction of the Skeena-Kitimat 287 kV transmission line are identified. Measures which may be utilized to reduce or eliminate these potential conflicts are suggested.

A map which depicts land status/tenure information is attached at the end of this report.

Resource tenures (eg: forest licences, traplines, guide/outfitter territories, etc.) are not included in this discussion. A review of these tenures is contained in the sections of the environmental studies report which deal specifically with those resource areas (eg: forestry, wildlife).

As B.C. Hydro does not hold legal rights to install a transmission line over either of the proposed Routes, these legal rights will have to be acquired once a Route has been chosen. This will involve both acquisition of right-of-way from the Crown in the case of Crown-owned land, and easements or other arrangements in the case of private land. These comments are applicable to the discussion of land status throughout the remainder of this section.

## 3.2 LAND STATUS AND USE - ROUTE A

### 3.2.1 Segment 1: Nodes 1-2-3-4-5-6-7

#### .1 General Description

The portion of Segment 1 which runs generally in an east-west direction is located on a flat plateau north of Lakelse Lake. The three options within Segment 1 (Nodes 2-5, 3-6 and 4-7) descend 400 metres from this plateau towards low lying, swampy areas north of

Lakelse Lake. The option located furthest to the west (Nodes 2-5) runs roughly parallel to this 400 metre escarpment and terminates at the foot of the escarpment. Water courses in this Segment include Williams and Sockeye Creeks, as well as smaller water courses which drain the swampy area north of Lakelse Lake. Access to this Segment is provided by the Terrace-Kitimat Highway (Highway 37) as well as several rural resource roads.

.2 Land Status

Segment 1 traverses through lands which are primarily Crown-owned. Privately held lots exist in the following locations:

- in the vicinity of the Skeena substation (District Lots 2275, 3060, 3059 and 997);
- surrounding Node 5 (District Lots 929, 5244 and 3982); and
- northeast of Node 7 (District Lots 5130 and 6253).

Notable features of the Crown-owned land within this Segment include:

- Pacific Northern Gas' pipeline rights-of-way which parallel Highway 37 between Nodes 3 and 6;
- Lakelse Lake Provincial Park (north), located from 100-500 metres south of the proposed route connection Nodes 5-6-7.

In addition, the initial portion of Segment 1 crosses through lands which fall within the Agricultural Land Reserve.

.3 Land Use

The use of land for utility rights-of-way is the most substantive land use within this Segment. B.C. Hydro's 5L63 and 2L99 transmission lines, Pacific Northern Gas' Kitimat (Alcan) and Ocelot pipelines and Highway 37 comprise the major utilities in this Segment. Other land uses in the area include recreational activities undertaken at Lakelse Lake Provincial Park (north) and

some minor residential development in the vicinity of Node 7. This residential development consists of four rural residences located on large parcels on District Lots 5130 and 6253, approximately 1 kilometre northeast of Node 7.

.4 Development Plans

The provincial Ministry of Transportation and Highways (MOTH) long range road system plan for the Kitimat-Terrace corridor identifies a proposed road running from south of the Skeena substation to Highway 37. This proposed road would intersect the transmission corridor near Node 2. In addition, the MOTH may eventually upgrade Highway 37, which parallels Segment 1 between Nodes 3 and 6, to a four lane highway.

No other development plans have been identified in this Segment.

.5 Water Licences

Williams Creek is the only water source within Segment 1 which is licenced for water supply. The federal Department of Fisheries and Oceans utilize water from Williams Creek for conservation purposes.

.6 Potential Conflicts and Mitigative Measures

Potential conflicts which may occur between land uses/development plans and transmission line construction within Segment 1 include:

- disruption of Pacific Northern Gas pipeline rights-of-way;
- right-of-way requirements of the MOTH to facilitate road upgrading projects;
- general disturbance of recreational and residential land uses in the vicinity of Segment 1; and
- disruption of the water licence held on Williams Creek.

In order to minimize these potential conflicts, the following steps should be taken:

- work closely with Pacific Northern Gas and the MOTH to identify the exact location of their utilities and rights-of-way and to ensure that B.C. Hydro's proposal is coordinated with these rights-of-way and development plans;
- minimize traffic, noise and disruption caused by construction; and
- where necessary, undertake hand-clearing of vegetation along Williams Creek to ensure that added siltation of this licenced water source does not occur.

### 3.2.2 Segment 2: Nodes 7-8

#### .1 General Description

Considerable variation in topography exists in the area traversed by Segment 2. The initial 8 kilometres of this Segment lie near the bottom of steep slopes descending from Mount Layton and Mount DeBoer toward the low lying, swampy areas on the eastern shore of Lakelse Lake. The following 4 kilometres of Segment 2 continue along a ridge before climbing 300 metres to the top of Forceman Ridge. Segment 2 then traverses a broad, flat area east of Onion and Clearwater Lakes before climbing steeply to Node 8, located approximately 1000 metres above the Kitimat River valley. Numerous water courses, including Furlong, Hatchery and Schulbuckhand Creeks, intersect Segment 2. Lakes in the area include Clearwater, Onion and Lakelse - the latter being the largest warm water lake in northwestern B.C. The Kitimat River intersects Segment 2 approximately 2 kilometres north of Node 8, before turning southward. Access to Segment 2 is provided by Highway 37 and the various resource roads extending from it.

#### .2 Land Status

Segment 2 is located on lands which are predominantly Crown-owned. Concentrations of private land are found in the following locations:

- between Lakelse Lake Park (north) and Lakelse Lake Park (south);

- west and south of Lakelse Lake Park (south); and

- on the crest of Forceman Ridge (District Lot 5965).

There are numerous reserves and other characteristics of Crown land within Segment 2 which must be noted. These include:

- Pacific Northern Gas' pipeline rights-of-way, which parallel Segment 2 over much of its length;

- Lakelse Lake Provincial Park (south), located just west of Segment 2 approximately 5 kilometres south of Node 7;

- Crown reserves for sand and gravel extraction located 5, 13, 17 and 18 kilometres south of Node 7;

- Crown reserves for the use, recreation and enjoyment of the public (U.R.E.P.) located east of Lakelse Hot Springs and surrounding Onion Lake; and

- the Crown reserve southwest of Onion Lake, which extends over much of Onion Flats to the west. The reserve is held on behalf of the Ministry of Regional and Economic Development for scientific and environmental research. Soil and seismic testing has recently been carried out on this reserve.

### .3 Land Use

A range of land uses exist within Segment 2. These land uses are concentrated in the areas surrounding Lakelse Lake. The Lakelse Lake area has been included in this Segment of the discussion of land use as Segment 2 is in close proximity to the majority of development surrounding Lakelse Lake. The extent of various land uses in the Lakelse Lake area is presented in Table 3.2.2. and depicted on Map 3.2.2.

TABLE 3.2.2

LAND USE - LAKELSE LAKE AREA

| USE | NUMBER OF PARCELS |
|---|---|
| Residential - permanent | 111 |
| Residential - temporary | 170 |
| Recreational | 13 |
| Commercial | 5 |
| Institutional/Community | 6 |
| Undeveloped | 114 |
| TOTAL | 419 |

Source: Kitimat-Stikine Regional District, Greater Terrace official Settlement Plan Background Studies

The nature and location of the land uses presented in Table 3.2.2 and on Map 3.2.2 may be summarized as follows:

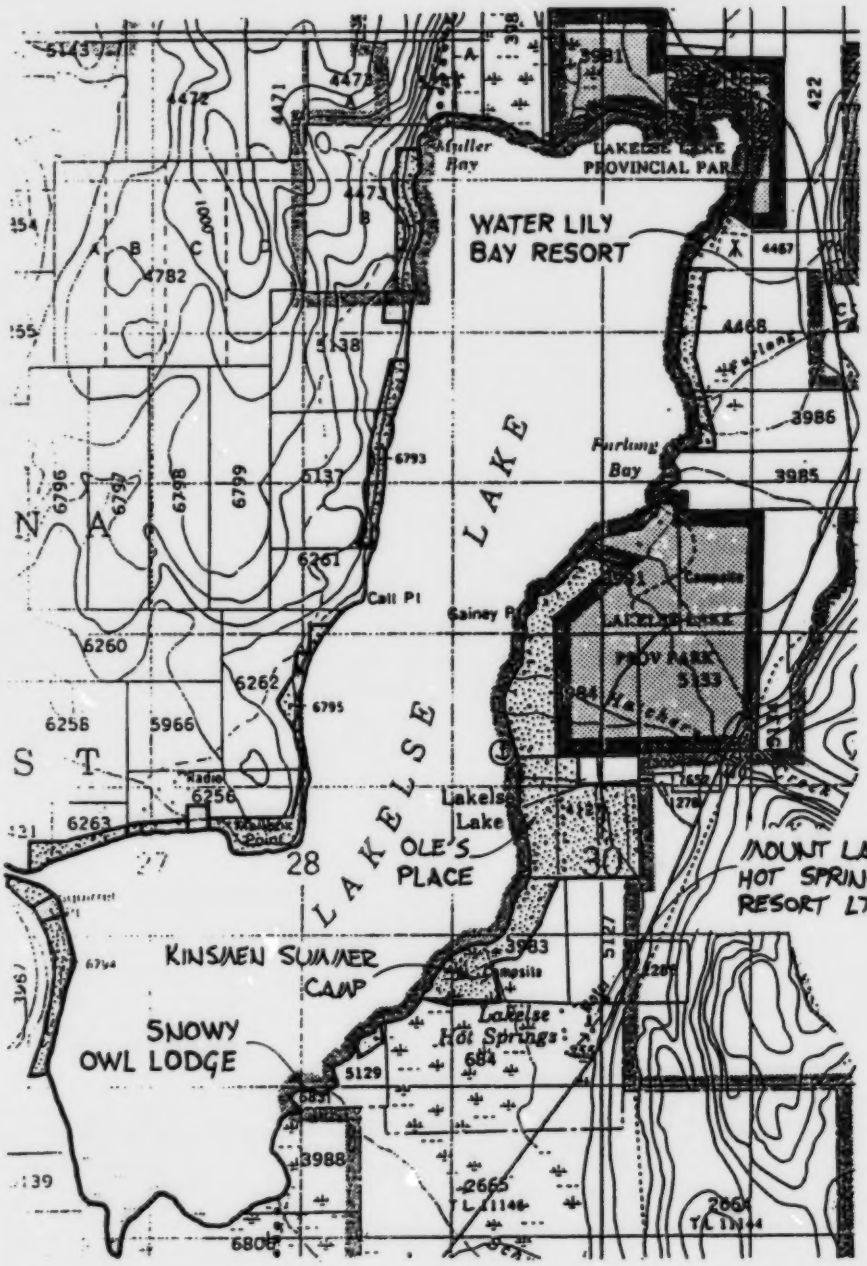
Residential - Permanent

These permanent dwellings are occupied for most of the year, with many acting as year-round residences. Such residential developments are concentrated in the following areas:

- between Lakelse Lake Provincial Park (north) and Lakelse Lake Provincial Park (south), both on the shore of the lake and inland;
- south of Lakelse Lake Provincial Park (south), primarily in District Lot 4127. Substantial development also exists along the lakeshore in District Lot 3983; and
- on the lakeshore to the west and north of Mailbox Point, on the western side of Lakelse Lake.

# MAP 3.2.2

# LAND USE IN THE LAKELSE LAKE AREA




RESIDENTIAL ( PERMANENT AND TEMPORARY)

RECREATIONAL ( PARKS AND RESERVES)

SOURCE : KITIMAT - STIKINE REGIONAL DISTRICT

Residential - Temporary

These temporary dwellings may be classified as seasonal cottages which are only used three to four months of the year. Such seasonal cottages are intermixed in the developed areas outlined above, as well as north of Catt Point and around Muller Bay on the lake's western shore.

Recreational

The two components of Lakelse Lake Provincial Park (north and south) and various recreation reserves surrounding the lake comprise the recreational land use in this area. Recreational activities which take place in these areas include picnicking, boating, fishing and swimming.

Commercial

Commercial establishments in the Lakelse Lake area include:

- Water Lily Bay Resort (District Lots 3980 and 4467) - this resort provides a marina, cabin rentals, boat storage and recreation vehicle sites;
- Ole's Place (District Lot 4127) - Ole's Place is a restaurant establishment;
- Lakelse Esso Service (District Lot 684) - a gas station and grocery store are included in this service station;
- Snowy Owl Lodge (District Lot 683) - in addition to acting as a hunting and fishing lodge, this establishment has a private air base; and
- Mount Layton Hot Springs Resort Ltd. (District Lot 684) - this is the largest commercial development on Lakelse Lake. It includes water slides, a therapeutic mineral water pool, restaurant, lounge and accommodations.

Institutional/Community

The provincial Ministry of Transportation and Highways and federal Department of Fisheries and Oceans utilize land in the Lakelse Lake area for institutional purposes (eg: highway maintenance, fisheries conservation and enhancement). In addition, the Kinsmen operate a summer camp west of the Mount Layton Hot Springs Resort (District Lot 3983).

Undeveloped

A significant portion of the land surrounding Lakelse Lake remains undeveloped. In fact, over one quarter (114) of the parcels examined were not developed for residential, commercial or other uses. A considerable portion of this land has been subdivided, however. Over 100 vacant lots intended for residential development have been subdivided.

Aside from the substantial development in the Lakelse Lake area, three types of land use exist within Segment 2. These are the recreational land use (eg: cross country skiing) in the Onion Lake-Clearwater Lake area, sand and gravel extraction from the Ministry of Transportation and Highways reserves along Highway 37 and the utility corridor (Pacific Northern Gas, B.C. Hydro) located east of Highway 37.

.4 Development Plans

Regulation of Development

Prior to examining the proposed developments within Segment 2, the regulation of such development must be discussed. The Kitimat-Stikine Regional District has two instruments which are important in this regard:

. Zoning Bylaw #57 (Lakelse Lake)

Adopted in 1979, this Bylaw covers the entire Lakelse Lake area. The Bylaw restricts residential lots to exiting subdivisions and sets 2 hectare (5 acre) minimum lot size for the remaining developable land in the area. Continued commercial development is allowed, provided strict sewage disposal guidelines are adhered to.

- Greater Terrace Area Official Settlement Plan (Proposed)

  This document, which has not yet been adopted, contains various recommendations which have implications for land use in the Lakelse Lake area. These include strict limits on residential development surrounding the lake, encouragement of infilling of vacant residential lots and allowance of commercial development with careful control over sewage disposal.

  In addition, the proposed Official Settlement Plan contains policies respecting provision of utilities. These policies encourage the maintenance of compatible land uses on and adjacent to major utilities, and support a cooperative and coordinated effort with the City of Terrace and other concerned government agencies and utilities vis-a-vis the provision and location of utility services.

Proposed Developments

Three broad types of proposed development are proposed within Segment 2. These are:

- Residential Development

  There is continuing interest in permanent and temporary residential development in the Lakelse Lake area. Given the existing and proposed development regulations of the Kitimat-Stikine Regional District, any additional development of this nature will be confined to infill in existing residential areas;

- Commercial Development

  Mount Layton Hot Springs Resort Ltd. has proposed a major expansion of its current facilities. These expansion plans include an 18 hole golf course, a resort hotel/convention centre with 300 rooms, a recreation vehicle campground, resort cabins and various other components.

- Highway Upgrading

  As noted above, the provincial Ministry of Transportation and Highway may eventually upgrade Highway 37 to a four lane highway.

.5 Water Licences

Twenty two water sources within Segment 2 are licenced for water supply. Major sources include Lakelse Lake (6 licences), Hatchery Creek (9 licences), Edward Creek (3 licences) and Crystal Creek (4 licences). The majority of licences permit water to be withdrawn for domestic purposes. Irrigation, conservation, the operation of waterworks, storage, industry and land improvement are other intended uses for water withdrawn from these sources. Mount Layton Hot Springs Resort Ltd. holds a licence to withdraw over 200,000 gallons/day from the Lakelse Hot Springs for 'mineral trading' purposes (eg: use in therapeutic pools).

.6 Potential Conflicts and Mitigative Measures

Potential conflicts which may occur between land uses/development plans within Segment 2 and construction of the proposed transmission line include:

- disruption of residential, recreational and commercial land use in the Lakelse Lake area. This disruption would result primarily from construction traffic and noise;

- disturbance of extraction of sand and gravel from the four active Ministry of Transportation and Highways pits located within this Segment;

- disruption of Pacific Northern Gas pipeline rights-of-way;

- disturbance of licenced water sources which intersect the transmission corridor (eg: Hatchery Creek, Schulbuckhand Creek); and

- aesthetic impacts of enlarging existing utility corridor. These impacts may become more acute if the proposed residential and commercial (Mount Layton Hot Springs Resort) developments in the Lakelse Lake area are advanced.

Measures which may be taken to mitigate these conflicts include:

- minimize use of Highway 37 and other often-travelled local roads by construction traffic;

- ensure that tower placement does not restrict use of existing sand/gravel pits or limit access to future sand/gravel resources;

- work closely with Pacific Northern Gas to identify the locations of their utilities and rights-of-way and to ensure that B.C. Hydro's proposal is coordinated with these rights-of-way; and

- identify water intakes on licenced water sources and ensure that these are not disturbed during construction. In addition, undertake hand clearing of vegetation where necessary to ensure that additional siltation of water sources does not occur.

It is also important that B.C. Hydro continue to work with the Kitimat-Stikine Regional District to maintain compatible land uses on and adjacent to major utilities. Such cooperation will help to fulfill the policy objectives of the Greater Terrace Area Official Settlement Plan, as well as ensure that the issues and concerns of the Regional District and its constituents are addressed.

### 3.2.3 Segment 3: Nodes 8-10, 8-9-10

#### .1 General Description

Segment 3 originates on a steep slope to the east of the Kitimat River valley, then plunges approximately 1,000 feet to the valley floor. The proposed route between Nodes 8 and 10 runs parallel to and east of Highway 37 along the floor of the valley. The proposed route between Nodes 9 and 10 is further to the east and

closer to the foot of the steep slopes of the mountains descending from the east. Much of Segment 3 traverses low lying, swampy terrain. Major watercourses in the area include the Kitimat River, which parallels Segment 3 to the west, and several watercourses (eg: Humphreys Creek, Nalbeelah Creek) which intersect Segment 3 along its route. Access to this Segment is provided by Highway 37 and several resource roads extending from it.

.2 Land Status

Segment 3 crosses land which is primarily Crown-owned. The only privately held land within this Segment is located in a cluster approximately 5-9 kilometres south of Nodes 8 and 9 (District Lots 8460 - 8464).

There are several other features which distinguish the proposed route between Nodes 8-10 from the proposed route between Nodes 8-9-10 in terms of land status and tenure. These are outlined below.

Nodes 8-10

The proposed route between Nodes 8-10 is adjacent to the rights-of-way for Pacific Northern Gas' pipelines over its entire length. This proposed route also traverses a Crown reserve approximately 1 kilometre south of Node 8, and passes through a provincial Agricultural Land Reserve from 4 kilometres south of Node 8 to Node 10.

Nodes 8-9-10

The proposed route between Nodes 8-9-10 traverses a Crown reserve 3 kilometres south of Node 9, and a Ministry of Transportation and Highways sand and gravel reserve 6 kilometres south of Node 9. This proposed route also passes through a provincial Agricultural Land Reserve between 10 and 11 kilometres south of Node 9.

.3 Land Use

The Kitimat Airpark, located west of Highway 37 approximately 5 kilometres north of Node 10, is the only developed land within this Segment. An airstrip capable of handling small aircraft and a mobile home/office are located at the Airpark, which is operated by the Kitimat Flying Club.

The sand and gravel reserve located 6 kilometres south of Node 9 is currently in use.

No other residential, commercial or other developments exist within this Segment.

.4 Development Plans

Local and provincial government agency representatives were not aware of any proposed developments within this Segment, with the exception of the Ministry of Transportation and Highways' long term plan involving the upgrading of Highway 37.

.5 Water Licences

No water licences exist within this Segment.

.6 Potential Conflicts and Mitigative Measures

Potential land use conflicts which may occur within this Segment include:

- disruption of Pacific Northern Gas' pipeline rights-of-way (Nodes 8-10); and
- disruption of sand and gravel extraction from the Ministry of Transportation and Highways sand and gravel reserve (Nodes 8-9-10).

Provided care is taken to identify utility locations, right-of-way requirements and optimum locations of transmission line support structures vis-a-vis sand and gravel reserves, these potential impacts can be mitigated.

### 3.2.4 Segment 4: Nodes 10-11, 10-12

#### .1 General Description

Segment 4 begins on a floodplain east of the Kitimat River, and crosses this river approximately 1.5 kilometres southwest of Node 10. The remainder of Segment 4 traverses across low lying, swampy areas with little variation in relief. This Segment terminates at the foot of a steep slope descending from Mount Clague to the west. The Kitimat River is the major water course in this Segment, with several smaller water courses draining the swampy areas adjacent to the Kitimat River. Access to this Segment is limited to a forestry road which intersects the transmission corridor approximately 2 kilometres northeast of Nodes 11 and 12.

#### .2 Land Status

Segment 4 passes through land which is entirely Crown-owned. The initial 1.5 kilometres of this Segment is located in the provincial Agricultural Land Reserve. The Segment crosses the Kitimat municipal boundaries approximately 3 kilometres southwest of Node 10. The Segment terminates at the boundary of Clague Mountain Park, a local-regional park leased to the District of Kitimat/Kitimat Stikine Regional District.

Another notable feature with respect to land status is the presence of the Pacific Northern Gas pipeline right-of-way. The proposed route between Nodes 10-11 is in close proximity to this pipeline right-of-way.

#### .3 Land Use

No residential, commercial or related land uses exist within Segment 4.

#### .4 Development Plans

A proposed ecological reserve is located approximately 1 kilometre south of Node 10. Local and provincial government agency representatives were not aware of any other proposed developments within this Segment. Any development would have to conform with the District of Kitimat's Zoning Bylaw No. 818, which designates the

portion of the municipality through which this Segment passes as Greenbelt-Floodplain and Greenbelt-Forestry zones. Utilities, including transmission lines, are permitted uses in these zones.

.5 Water Licences

No water licences exist within this Segment.

.6 Potential Conflicts and Mitigative Measures

Provided care is taken to identify the exact location of the Pacific Northern Gas pipeline and work with that utility to ensure that the pipeline right-of-way is not disturbed, no land use conflicts are anticipated.

## 3.3 LAND STATUS AND USE - ROUTE B

### 3.3.1 Segment 1: Nodes 1-13

.1 General Description

Segment 1 is characterized by considerable variation in topography. The initial 4 kilometres climb gently to a steep bluff located north of the Lakelse River. The Segment then spans the Lakelse River and continues on a flat bench south of the river for 3 kilometres. The remaining 5 kilometres of Segment 5 is located at the foot of steep slopes descending from Mount Johnstone and other peaks to the west. The Lakelse River is the major water course in the area. Hai Lake, Herman Lake and Ena Lake are all located east of this Segment. Access to this area is limited to Beam Station Road, which extends from west of the Terrace Airport to Mailbox Point on Lakelse Lake, and various forestry and other resource roads extending from it.

.2 Land Status

Privately owned land in the vicinity of the Skeena substation (District Lots 2275, 3059 and 3060) is the only land within Segment 1 which is not Crown-owned. Other notable features of land status and tenure in this Segment include:

- Agricultural Land Reserve areas in the Skeena substation area and south of the Lakelse River;

- a Crown reserve for the use, recreation and enjoyment of the public (U.R.E.P.) located southeast of the Lakelse River crossing;

- Indian Reserves (Lakgeas I.R. #87 and Lakelse I.R. #25) located southeast of the Lakelse River crossing; and

- Canadian National Railway right-of-way which passes under the proposed transmission corridor 5 kilometres south of Node 1, on the north bank of the Lakelse River.

## .3 Land Use

Transportation (CN Railway), utility operation (B.C. Hydro substation) and recreation (hunting, fishing) are the only land uses within this Segment. No residential, commercial or related land uses exist.

## .4 Development Plans

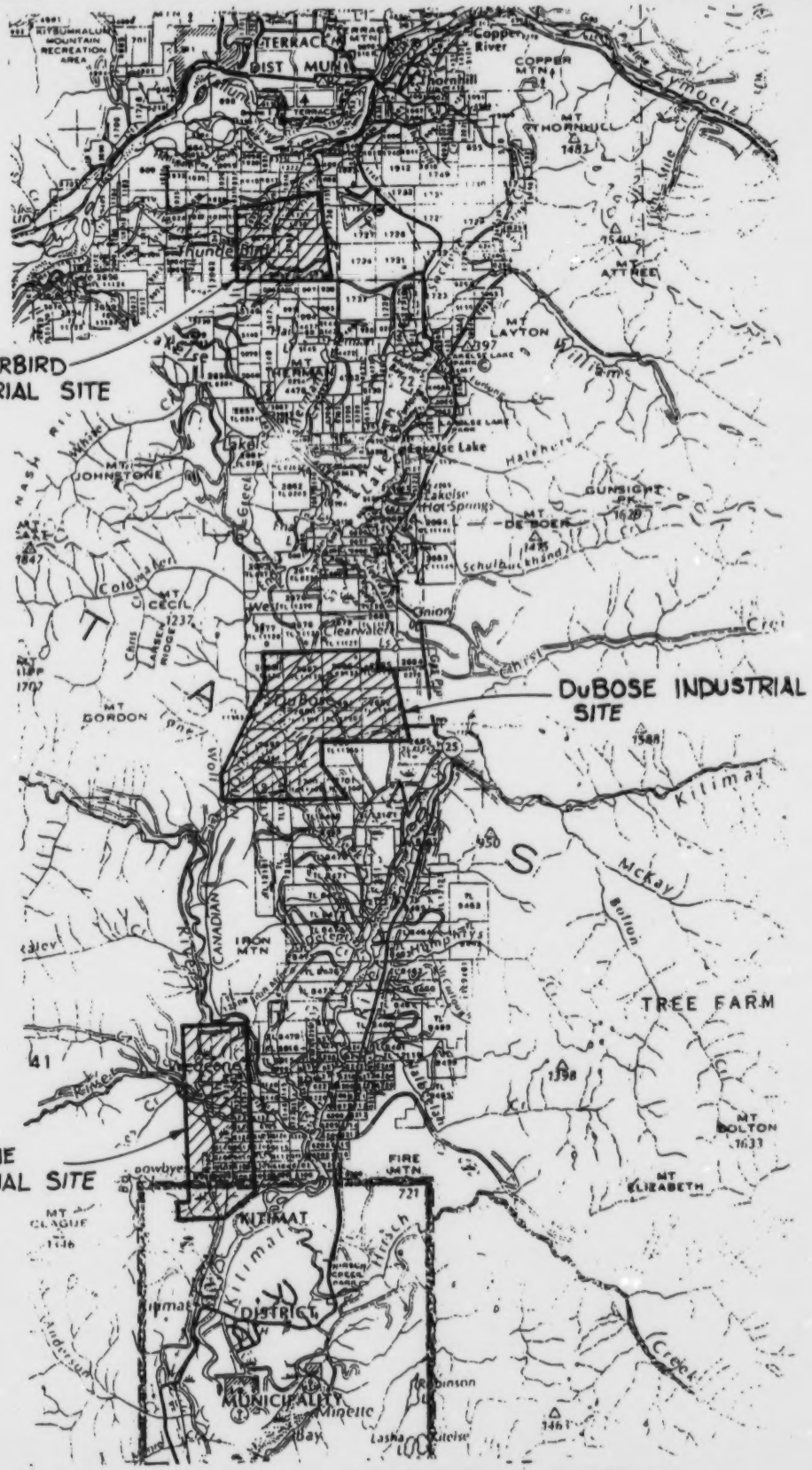
In 1981, the Kitimat-Stikine Regional District prepared a regional resource inventory which included the identification of possible industrial sites in the Terrace-Kitimat corridor (see Map 3.3.1). This inventory and accompanying land use plan has no formal status. One of these sites is referred to as the Thunderbird Industrial Site, located adjacent to the Skeena substation. The characteristics of this site are summarized below in Table 3.3.1

**TABLE 3.3.1**

**CHARACTERISTICS OF PROPOSED THUNDERBIRD INDUSTRIAL SITE**

| | |
|---|---|
| Size: | 80 hectares |
| Servicing: | C.N. Railway<br>Canadian Airlines, Air B.C.<br>Pacific Northern Gas<br>B.C. Hydro<br>Developed Road Access<br>Adjacent to Terrace Airport |
| Suitability: | Large Scale Industrial<br>Light Industrial Park Complex |

# MAP 3.3.1 POTENTIAL INDUSTRIAL SITES TERRACE - KITIMAT CORRIDOR




SOURCE : KITIMAT - STIKINE REGIONAL DISTRICT

No development has taken place at this industrial site to date. However, the site may be utilized should industrial expansion take place in the Terrace-Kitimat corridor.

The Ministry of Transportation and Highways long range road system plan for Kitimat-Terrace corridor identifies a proposed road in this Segment. This proposed road would cross the Lakelse River to the east of Segment 1, and then veer off toward the eastern side of the valley.

A proposed ecological reserve is located on the north-facing slopes of Mount Herman, approximately 2 kilometres east of the proposed transmission route.

Local and provincial government agency representatives were not aware of any further proposed developments within Segment 1.

.5 Water Licences

No water licences exist within Segment 1.

.6 Potential Conflicts and Mitigative Measures

No potential land use conflicts are anticipated within Segment 1. Should industrial development proceed on the Thunderbird Industrial Site, the presence of a 287 kV transmission line would not be viewed as a negative feature, particularly if the proximity of the line and substation would reduce industrial connection costs.

3.3.2 Segment 2: Nodes 13-14

.1 General Description

Segment 2 is located at the foot of steep slopes descending from the Kitimat Ranges to the west. Several water courses which plunge from these steep mountain slops intersect the proposed transmission corridor (eg: Coldwater Creek, Lone Wolf Creek). West Lake, located east of Segment 2 approximately 2.5 kilometres south of Node 13, is the only water body in this area. Access to this Segment is very limited, and can be accomplished only via rough resource roads.

.2 Land Status

Land within Segment 2 is entirely Crown-owned, and is not under Crown reserve or any related tenure.

.3 Land Use

There are no existing residential, commercial or related land uses within Segment 2.

.4 Development Plans

Local and provincial government agency representatives were not aware of any proposed developments within Segment 2.

.5 Water Licences

No water licences exist within Segment 2.

.6 Potential Conflicts and Mitigative Measures

No conflicts are anticipated within Segment 2.

3.3.3 Segment 3: Nodes 13-15

.1 General Description

Segment 3 traverses predominantly flat terrain punctuated by steep-sided hilly features. These features are located to the west of this Segment, and separate it from the proposed Segment 2. Coldwater Creek and Cecil Creek intersect the proposed transmission corridor 0.5 and 7 kilometres south of Node 13, respectively. End Lake and West Lake are both located in the northern portion of this Segment. Access to this Segment is limited to rough resource roads.

.2 Land Status

The lands through which Segment 3 passes are entirely Crown-owned. There are, however, two large Crown reserves in this area.

These reserves are both located predominantly east of Segment 3 (between the hilly features on the west side of the valley and Highway 37 on the east) and have boundaries which are roughly coincident. These reserves were set aside on behalf of the following agencies:

- Ministry of Forests Map Notation, for research purposes; and
- Ministry of Regional and Economic Development, for soil and seismic testing.

In addition, the CN Railway right-of-way intersects Segment 3 approximately 7 kilometres south of Node 13.

.3 Land Use

The CN Railway transportation corridor represents the only land use within this Segment. No residential, commercial, industrial or related land uses exist.

.4 Development Plans

The Kitimat-Stikine Regional District identified a second potential industrial site, which falls within Segment 3. The characteristics of the Dubose site, shown on Map 3.3.1, are outlined below:

**TABLE 3.3.3**

**CHARACTERISTICS OF PROPOSED DUBOSE INDUSTRIAL SITE**

| | |
|---|---|
| Size: | 3,200 hectares |
| Servicing: | CN Railway<br>Pacific Northern Gas<br>Canadian Airlines, Air B.C.<br>B.C. Hydro<br>Road Access to Highway 37 (upgrading proposed) |
| Suitability: | Large scale industrial complex |

No industrial development has taken place at this site, although it is still looked upon as a possible location for future industrial activities.

The Ministry of Transportation and Highways' long range road system plan for the Kitimat-Terrace corridor identifies two proposed roads in this Segment. The first is a road which would run parallel to Segment 3 between Nodes 13 and 15, and the second would involve a link between Dubose (on the CN Railway) and Highway 37, across Onion Flats.

No other proposed developments within this Segment were identified by local or provincial government agency representatives.

.5 Water Licences

No water licences exist within Segment 3.

.6 Potential Conflicts and Mitigative Measures

Given the industrial nature of possible development within this Segment, no land use conflicts are anticipated.

B.C. Hydro should undertake further consultation with the Ministry of Transportation and Highways to ensure that the proposed developments of each party are approached in a coordinated fashion.

3.3.4 Segment 4: Nodes 14/15 - 11/12

.1 General Description

The initial 10 kilometres of Segment 4 can be separated into two broad areas. The proposed route connecting Nodes 14-16-18-20-22-24 is located on the lower slopes of steep sided mountains plunging into the Lone Wolf Creek/Wedeene River valley from the west. The proposed route connecting Nodes 15-17-19-21-23-24 traverses slopes rising to the east from the Lone Wolf Creek/Wedeene River valley. Four options which cross this valley have been proposed. From Node 24 to Node 11/12, the proposed route traverses a variety of terrain, including steep slopes and low lying, marshy

areas. Major water courses in this Segment include Lone Wolf Creek, the Wedeene River and the Little Wedeene River. Access to this Segment is provided by a forestry road which runs north along the Wedeene River valley.

.2 Land Status

The land through which Segment 4 passes is entirely Crown-owned. Segment 4 crosses the Kitimat municipal boundary 3 kilometres south of Node 27. Crown tenures in this area include:

- a Ministry of Forests map notation in the vicinity of Nodes 24-27. Land in this area is used by this Ministry for forestry research purposes; and

- Clague Mountain Park, located west of this Segment between Nodes 27 - 11/12. This park is leased by the Crown to the District of Kitimat/Kitimat-Stikine Regional District.

The CN Railway right-of-way is also located within this Segment.

.3 Land Use

The CN Railway transportation corridor is the only land use within this Segment. No residential, commercial, industrial or related land uses exist.

.4 Development Plans

The third potential industrial site identified in the Kitimat-Stikine Regional Districts regional resource inventory is located between Nodes 27 and 11/12 in this Segment. The characteristics of this site, referred to as the Wedeene Industrial Site and shown on Map 3.3.1, are outlined on the following table.

TABLE 3.3.4

CHARACTERISTICS OF PROPOSED
WEDEENE INDUSTRIAL SITE

| | |
|---|---|
| Size: | 1,900 hectares |
| Servicing: | CN Railway<br>Pacific Northern Gas<br>Canadian Airlines, Time Air<br>B.C. Hydro<br>Road Access |
| Suitability: | Large scale industrial complex |

No industrial development has taken place at the Wedeene site. However, future large scale industrial activities may possibly locate at this site.

No other proposed developments within this Segment were identified by local or provincial government agency representatives. Any development would have to conform with the District of Kitimat's Zoning Bylaw No. 818, which designates the portion of the municipality through which this Segment passes as a Greenbelt-Forestry zone. Utilities, including transmission lines, are permitted uses in this zone.

.5 Water Licences

No water licences exist within this Segment.

.6 Potential Conflicts and Mitigative Measures

No conflicts between possible industrial development at the Wedeene site and the proposed transmission line are anticipated.

## 3.4 LAND STATUS AND USE - ROUTE AB

### 3.4.1 Segment 1: Nodes 11/12-28

#### .1 General Description

This Segment of the proposed transmission line climbs sharply from Nodes 11/12 to a position on the steep slopes which descend intc the Kitimat River valley. The transmission route continues along this slope at an elevation of 600-800 feet before descending to the proposed Kitimat substation. Several water courses, including Anderson Creek, drop steeply from the mountain slopes west of Kitimat and intersect this Segment. Access to this Segment is limited to transmission line right-of-way access roads.

#### .2 Land Status

This segment traverses land which is predominately Crown-owned. The only privately held land over which the proposed right-of-way passes is District Lot 7648, located 3 kilometres south of Node 12. While a large concentration of private land does exist in this area, it is virtually all located to the east of the proposed right-of-way.

This Segment passes through the eastern-most point of Clague Mountain Park, at a point 500 metres south of Node 12. This is the only Crown reserve through which this Segment passes.

The entirety of this Segment falls within the boundaries of the District of Kitimat.

#### .3 Land Use

As this Segment is located on the steep slopes which descend into the Kitimat River valley in the District of Kitimat, it does not pass through any developed land. However, substantial land development does exist within 1 kilometre east of the proposed route. This development is comprised of the following industrial activities:

Kitimat Station/Service Centre

This light industrial complex is comprised of automobile services and dealerships, building suppliers and contractors, warehousing and distribution facilities, steel fabricators and related businesses and industrial establishments;

Eurocan Pulp and Paper Co.

This facility produces unbleached kraft pulp, liner board, clupak and sackkraft for European, Asian and Canadian markets;

Ocelot Ammonia Co.

This plan produces methanol and ammonia for Japanese, European and Canadian markets;

Alcan Smelters and Chemicals Ltd.

The Alcan smelter at Kitimat is the second largest aluminum smelter in the western world. Aluminum ingots produced are exported to Japan, Korea and southeast Asia, or sold on domestic markets.

.4 Development Plans

Regulation of Development

The District of Kitimat has two instruments which act to regulate the development of land. These are:

- District of Kitimat Zoning Bylaw No. 818

  This Segment falls within two zones designated by this Bylaw. These are the Greenbelt-Forestry and Manufacturing-Heavy Industry zones. Utilities, including transmission lines, are permitted uses in these zones.

- District of Kitimat Official Community Plan

  The land use guidelines set out in this Official Community Plan include the following land uses in the area traversed by this Segment:

  - park use (Clague Mountain Park);
  - proposed industrial area (vicinity of Kitimat Service Centre);
  - forest licence area (slopes descending into Kitimat River valley; and
  - existing industrial area.

  The planning department at the District of Kitimat did not feel that the proposed transmission route contravened the guidelines set out for these land uses, or was incompatible with these land uses.

Proposed Developments

Developments which are proposed or underway in Kitimat's industrial area include plant expansions at Alcan (casting centre) and Eurocan (new pulp mill, upgraded linerboard machine, enlarged warehouse). Any additional future developments would be in keeping with this form of land use.

.5 Water Licences

Two sources licenced for water supply are located within this Segment. These are the Kitimat River, from which Kentron Construction Ltd. draws 25,000 gallons/day for industrial use, and Anderson Creek, which supplies water to Alcan and Eurocan for industrial use.

.6 Potential Conflicts and Mitigative Measures

This Segment passes through an area which is currently and will continue to be used for industrial purposes. Given this land use context, conflicts are not anticipated.

B.C. Hydro should, however, work with the District of Kitimat and Kitimat-Stikine Regional District to ensure that recreation use in Clague Mountain Park is not disturbed. In addition, steps should be taken to avoid disruption of Anderson Creek, which supplies water to Alcan and Eurocan.

## 3.5 SUMMARY

### 3.5.1. General Description

The proposed routes traverse the broad valley lying between the City of Terrace, located on the Skeena River, and the District of Kitimat, located at tidewater at the end of the Douglas Channel. Proposed Route 'A' cuts across this broad valley south of Terrace before traversing across predominantly low lying, swampy terrain on the eastern side of the valley. Route 'A' then crosses the Kitimat River to join proposed Route 'B' in Kitimat. Proposed Route 'B' runs along the foot of steep slopes descending from the Kitimat Ranges of the Coast Mountains to the west before joining Route 'A'. The final stages of this proposed transmission route lie on the slopes to the west of the Kitimat River, descending sharply from these slopes to the Kitimat substation at the line's southern terminus. Major water bodies in the area include Lakelse Lake,

the Kitimat, Lakelse and Wedeene Rivers and several other smaller creeks plunging from the mountain slopes bordering the valley. Access to these proposed transmission routes is provided by the Terrace-Kitimat Highway (Highway 97), Beam Station Road south of Terrace and the network of resource roads extending from these main roads.

### 3.5.2 Land Status

The proposed transmission routes pass over land which is primarily Crown-owned. Clusters of private land are located in the vicinity of the Skeena substation, surrounding Lakelse Lake, in the Humphreys Creek/McCullough Creek area and within the District of Kitimat. There are several Indian Reserves in the area, notably on the Lakelse River and east of the proposed route within the District of Kitimat. Other important aspects of land status and tenure include numerous Crown reserves (sand and gravel reserves, reserves for the use, recreation and enjoyment of the public, reserves set aside on behalf of the Ministries of Forests and Regional and Economic Development), Lakelse Lake Provincial Park, the Pacific Northern Gas pipeline rights-of-way on the eastern side of the valley and the location of Agricultural Land Reserve areas throughout the valley.

### 3.5.3 Land Use

In the context of residential, commercial, industrial and related land uses, much of the land through which the proposed routes pass is unused land. Areas where substantial land uses exist include:

- surrounding Lakelse Lake, where some 300 parcels are used for residential, recreational, commercial and related purposes;
- within the District of Kitimat near the line's southern terminus, where light industrial and large manufacturing facilities are located in close proximity to the proposed transmission route.

In addition, several utilities and transportation corridors are located near the proposed routes. Route 'A' runs roughly parallel to existing transmission lines, pipelines and Highway 37 over much of its length. Route 'B' is in close proximity to the CN Railway. The combined routes parallel an existing transmission line.

### 3.5.4 Development Plans

Various developments have been proposed for the valley between Terrace and Kitimat. These include:

- additional residential/recreational development around Lakelse Lake. This development will be limited to infilling in existing subdivisions;
- a proposal to expand the commercial/recreational facilities located at the Mount Layton Hot Springs Resort;
- possible development of three major industrial sites in the valley (Thunderbird, Dubose and Wedeene sites); and
- long term objective of the Ministry of Transportation and Highways to upgrade Highway 37 and other roads in the valley.

### 3.5.5 Water Licences

Along proposed Route 'A', there are 20 water sources licenced for water supplies. Forty-two licencees withdraw water from these sources for domestic, conservation, irrigation, waterworks, storage, industrial, land improvement and mineral trading (hot springs) purposes. Multiple licences exist on Lakelse Lake, Hatchery Creek, Edward Creek and Crystal Creek. No water licences exist along proposed Route 'B'. At the southern terminus of the proposed transmission route, where Routes 'A' and 'B' are combined, Kentron Construction Ltd. withdraws water from the Kitimat River for industrial use, and Alcan and Eurocan Pulp and Paper withdraw water from Anderson Creek for industrial and waterworks purposes.

### 3.5.6 Potential Conflicts and Mitigative Measures

Potential conflicts which may result from construction of the proposed transmission line include:

- disruption of Pacific Northern Gas pipeline rights-of-way;
- disturbance of extraction of sand and gravel from active Ministry of Transportation and Highways reserves;
- disruption of water intakes and water sources by construction activities; and
- general disturbance or residential, recreation and commercial land uses in the area.

Steps which may be taken to mitigate these potential conflicts include:

- cooperate with Pacific Northern Gas to identify the exact location of their rights-of-way and utilities and to ensure that B.C. Hydro's proposal is coordinated with these rights-of-way;

- ensure that tower placement does not restrict use of existing sand/gravel pits or limit access to future sand/gravel resources;

- carefully locate water intake structures and ensure that these intakes and the sources from which they draw are not disturbed during construction. Hand clearing of vegetation may be necessary in some instances, as may the retention of a buffer strip of vegetation to minimize siltation of the water source; and

- in general, minimize the noise, traffic and other disruptive factors associated with construction in order to reduce disturbance of land uses in the area.

## 4.1 INTRODUCTION

Considerable variation exists in the status and use of lands in the vicinity of the two proposed routes. As a consequence, the impacts which would result from the selection of Route 'A' differ substantially from the impacts which would result if Route 'B' were chosen. The purpose of this section of the report is to identify the most acceptable route from the perspective of land status and use.

As noted in the introduction to this report (Section 1.2), the possibility of utilizing double-circuit transformers on either Route 'A' or Route 'B' has been identified as an alternative to facilitate the transmission of additional power between the Skeena and Kitimat substations. This possibility is also addressed in this section.

## 4.2 COMPARISON OF ROUTES 'A' AND 'B' - SINGLE CIRCUIT

### 4.2.1 Introduction

Outlined below are the positive and negative land status/use impacts which may result from the utilization of Routes 'A' and 'B' for the proposed transmission line right-of-way.

### 4.2.2 Route A

The only positive impact which may result from the use of Route 'A' relates to the maintenance of a common utility corridor through the Terrace-Kitimat Valley. The creation of an additional B.C. Hydro right-of-way in the existing corridor would be in keeping with a policy contained in the proposed Greater Terrace Area Official Settlement Plan, which encourages the maintenance of compatible land uses on and adjacent to major utilities.

Negative impacts which may result from the use of Route 'A' include:

- the need for a wider 287 kV transmission line right-of-way (ROW) in order to accommodate Pacific Northern Gas' pipelines;
- several privately-owned parcels are traversed by the ROW, necessitating the acquisition of easements or other arrangements;

- Ministry of Transportation and Highways' sand and gravel reserves are traversed by the ROW, possibly disrupting or precluding extraction of aggregate resources from those reserves;

- the ROW is in close proximity to Lakelse Lake Provincial Park, the focus of considerable recreation activity. The proposed right-of-way does not, however, further impinge on the boundaries of the Park;

- several reserves for the use, recreation and enjoyment of the public (U.R.E.P.'s) are traversed by or in close proximity to the ROW;

- The ROW traverses/is in close proximity to several other Crown reserves (eg. reserves held on behalf of the Ministry of Regional and Economic Development);

- a proposed ecological reserve is located near the proposed ROW;

- extensive development exists within 1 - 2 kilometres of the ROW in the vicinity of Lakelse Lake;

- numerous licenced water sources intersect or are in close proximity to the ROW; and

- the ROW is in proximity to substantial proposed commercial, residential and recreational development, notably in the Lakelse Lake area.

4.2.3 Route B

From the land status and use perspective, there are at least three positive features associated with the use of Route 'B' for the proposed transmission line ROW. These are:

- the ROW would be located entirely on Crown-owned land;

- there are no substantive residential, commercial, industrial, or related land uses in the vicinity of the proposed route; and

- the proposed route would be in close proximity to the proposed industrial sites in the Terrace-Kitimat corridor.

Potential negative impacts which may result from the use of Route 'B' include:

- the ROW traverses several Map Notations established on behalf of the Ministry of Forests; and
- the ROW traverses other Crown reserves.

4.2.4 Summary

It is apparent from the foregoing analysis that, from a land status/use perspective, Route 'B' would be more acceptable than Route 'A'. This conclusion is based on the fact that the numerous negative and few positive impacts associated with Route 'A' are outweighed by the greater number of positive and fewer negative impacts associated with Route 'B'.

## 4.3 COMPARISON OF ROUTES 'A' AND 'B' - DOUBLE CIRCUIT

4.3.1 Introduction

The following discussion outlines, in general terms, the relative benefits and costs of installing double-circuit structures on proposed Route 'A' or Route 'B'.

4.3.2 Route A

The installation of double circuit structures on Route 'A' would involve dismantling the existing 287 kV transmission line (2L99) and placement of the existing and proposed 287 kV transmission line (2L104) on steel lattice structures. This arrangement would occupy the existing 287 kV transmission line right-of-way. The benefits of installing a double-circuit on Route 'A' include the continuing use of well-established right-of-way and the maintenance of a common utility corridor. In addition, many of the negative impacts outline above with respect to the use of Route 'A' for an additional single circuit transmission line are not applicable here, as a new right-of-way will not be required. Finally, any impacts would be incremental in nature.

4.3.3 Route B

The installation of double circuit structures on Route 'B' would involve acquisition of a new right-of-way, dismantling the existing 287 kV transmission line (2L99) on the east side of the Terrace-Kitimat Valley and placement of the existing and proposed 287 kV transmission lines on steel lattice

structures within the new right-of-way. Each of the positive and negative impacts outlined above in regard to the use of Route 'B' for a single circuit transmission line pertain equally in this instance. Furthermore, it must be noted that few if any benefits would be realized by releasing the existing 287 kV transmission line right-of-way on the valley's east side, as the ROW is located in the midst of a developed utility corridor.

4.3.4 Summary

From a land status/use perspective, Route 'A' would be more acceptable than Route 'B'. The ability to use a well established right-of-way in an existing utility corridor was a key factor in reaching this conclusion. Other important considerations include the incremental nature of any negative impacts resulting from the use of Route 'A', and the lack of benefits which would be realized from the release of the existing 287 kV transmission line (2L99) right-of-way.

## 5.1 INTRODUCTION

This section reviews the socio-economic impacts which are anticipated to result from the construction of the proposed Skeena-Kitimat 287 kV transmission line. The section is structured in the following fashion:

.1 Project Information

Outlines the proposed cost, construction activities and phasing/timing of transmission line construction;

.2 Characteristics of Communities in Study Area

Reviews populations, economic activities, labour force characteristics, and other pertinent information regarding communities in the Terrace-Kitimat area;

.3 Social and Economic Impacts

Describes employment, accommodation, spending, and other community impacts which are anticipated to occur as a result of the construction of the proposed transmission line.

## 5.2 PROJECT INFORMATION

### 5.2.1 Project Cost

The estimated total cost of the proposed project is dependant upon the route and type of support structure used. If single circuit support structures are used, the project cost would be between $16 - $18 million. If double circuit support structures are used, project costs would escalate substantially to approximately $35 million. These cost estimates include both capital and labour costs, and account for inflation, corporate overhead and interest during construction.

### 5.2.2 Construction Activities

Various activities would be involved in the construction of the proposed Skeena-Kitimat 287 kV transmission line. These activities, and the skills required to complete them, are outline below.

- Surveying/Forestry

The centreline of the transmission route to be used must be surveyed. In addition to ground surveying, crews will be involved in flagging, cruising and mapping timber for future clearing work. Surveying and forestry skills are required to complete these activities.

- Relocation of 2L103 Transmission Line at Kitimat

The relocation of several spans of the existing 287 kV transmission line in the vicinity of the Kitimat substation is required. Skills required to undertake this work include linemen, equipment operators, teamsters and labourers.

- Right-of-Way Clearing

The removal of trees to allow construction of the transmission line and cleanup of remaining vegetation and slash are the principal activities involved in right-of-way clearing. Fallers, equipment operators, inspectors and labourers are required to undertake clearing.

- Transmission Line Construction

A number of tasks are involved in the actual construction of the transmission line. These include access road construction, upgrading and site preparation; material delivery; earth excavations; rock excavations; pole setting; structure framing; conductor installation; dead-ending, sagging and clipping of the conductor; and, finally, cleanup. Skills required to undertake this work include linemen, rock workers, equipment operators, teamsters, inspectors and labourers.

- Civil Construction

Line termination and associated switching facilities will have to be installed at the Skeena substation. In addition, a new microwave communications link with the Kitimat substation is required. Steel erectors, equipment operators, general tradesmen and teamsters are needed to undertake related civil construction activities.

- Electrical Installation

In addition to civil construction activities, work at the Skeena substation will require linemen, wiremen and equipment testers.

- Right-of-Way Restoration

  Following transmission line construction, the right-of-way must be restored (eg: site grading, revegetation, etc.). Skills required to undertake these activities include equipment operators, labourers and inspectors.

5.2.3 Phasing and Timing of Construction

Table 5.2.3 outlines the phases involved in the proposed transmission line construction project, along with the expected timing and workforce requirements associated with each of the phases. The following points clarify the information presented in this table:

- workforce requirements represent the peak number of workers required during each phase of construction;
- the estimated duration of construction phases for Route 'A' differ from Route 'B'. Therefore, both estimates are given on Table 5.2.3; and
- proposed activities to be undertaken in 1994 include transmission line construction as well as installation of line termination and switching facilities at the Skeena substation. These different activities are reflected in Table 5.2.3.

The total elapsed time required to complete the seven phases of transmission line construction is expected to be five years, from 1991 through 1995. As construction requires a succession of activities to take place for a relatively short period in each location along the transmission route, it is difficult to pinpoint the exact timing of each activity. Column 2 in Table 5.2.3 provides a broad indication of timing of each of the construction phases. Exact timing may vary depending on regulatory approvals, location along the transmission corridor and other factors.

Exact workforce requirements are also difficult to predict. These requirements may vary according to factors such as:

- time of year;
- location along the transmission corridor; and
- exact workforce requirements of contractors.

TABLE 5.2.3

TIMING AND WORKFORCE REQUIREMENTS OF
PHASES OF PROPOSED SKEENA-KITIMAT
287 kV TRANSMISSION LINE PROJECT

| PHASE | TIMING[1] | DURATION (A)[2] (Months) | DURATION (B)[3] (Months) | WORKFOR REQUIREME |
|---|---|---|---|---|
| Surveys | 1991 | 5 | 4 | 10 |
| Relocation of 2L103 at Kitimat | 1992 | 1 | 1 | 10 |
| Right-of-Way Clearing | 1993 | 7 | 6 | 40 |
| Transmission Line Construction | 1994 | 6 | 5 | 40 |
| Civil Construction (Skeena Substation) | 1994 | 2 | 2 | 5 |
| Electrical Installation (Skeena Substation) | 1994 | 3 | 3 | 10 |
| Right-of-Way Restoration | 1995 | 3 | 2 | 5 |

Source: B.C. Hydro - Transmission Engineering

Notes: [1] Exact timing of phases of construction may vary.

[2] Duration if Route 'A' used.

[3] Duration if Route'B' used.

[4] Peak workforce expected over duration of phase.

Column 5 in Table 5.2.3 is therefore intended to provide only an indication of expected peak workforces by phase of construction. What is evident from this information is that the most significant workforce requirements occur during the right-of-way clearing and transmission line construction phases, with all other phases requiring substantially smaller workforces.

## 5.3 CHARACTERISTICS OF COMMUNITIES ALONG PROPOSED TRANSMISSION ROUTES

### 5.3.1 Introduction

Outlined below are various characteristics of the communities located in the vicinity of the Skeena and Kitimat substations and along the proposed transmission routes. These characteristics include population, economic base, unemployment and labour/contractor availability, economic development initiatives and attitudes toward growth. This discussion is structured in a linear fashion, beginning at Terrace, near the Skeena substation, and concluding at Kitimat.

### 5.3.2 City of Terrace

#### .1 Population

The City of Terrace has a population of 10,532 (1987). The City's population declined by 3.5% over the period from 1981-1987. This decline followed a ten year period which saw the population of the City increase by nearly 1,000.

#### .2 Economic Base

Terrace is the regional business centre for the Skeena-North Coast region. The strategic location of Terrace within this region, coupled with its excellent transportation and communication links, have attracted private and public sector administrative offices, regional shopping facilities and other business-related services to the community. The harvesting and processing of resources (timber, minerals) are also of critical importance to the Terrace economy. The three major resource-based industries in the community are Skeena Cellulose, West Fraser Sawmills and Bell Pole Company. Together, these three industries employ over 500 people in the community.

Table 5.3.2 provides a more detailed assessment of the Terrace economy. This assessment clearly demonstrates the dominance of the trade and service sectors in the Terrace economy. These sectors employ 47% of the City's labour force. The importance of primary (forestry) and transportation sectors is also evident, with 26% of the labour force employed in these industries. Other sectors of the City's economy, in decreasing order of relative importance, include manufacturing, public administration, construction and financial services.

**TABLE 5.3.2**

**TERRACE LABOUR FORCE BY INDUSTRY**

| INDUSTRY | PERCENT TOTAL OF LABOUR FORCE |
|---|---|
| Primary | 12 |
| Manufacturing | 9 |
| Construction | 5 |
| Transportation, Communications and Utilities | 14 |
| Trade | 18 |
| Finance, Insurance and Real Estate | 4 |
| Service | 29 |
| Public Administration | 9 |
| TOTAL | 100 |

Source: Census of Canada, 1986

.3 Unemployment and Labour/Contractor Availability

The unemployment rate in Terrace in 1989 was estimated at 7%. Among the unemployed is a substantial pool of workers capable of participating in transmission line construction activities. The following is an indication of labour availability in four key areas as of October, 1989:

- Forestry/logging - 102 workers available;
- Construction trades/ occupations - 137 workers available;
- Equipment operation - 60 workers available; and
- Other labour - 176 workers available.

Discussions with the Canada Employment Centre in Terrace indicate that contractors with skills and experience relevant to transmission line construction activities are located in the Terrace area. As forestry is such an integral component of the Terrace economy, it follows that numerous forestry/logging/silviculture firms are located in this area. There are also heavy equipment firms, trucking contractors, electrical contractors and general construction/project management firms located in the Terrace area who may be able to participate in various phases of transmission line construction.

.4 Economic Development Initiatives

The Economic Development Office of the City of Terrace, as well as other agencies, have been aggressively pursuing economic development initiatives in recent years. The focus of these initiatives has been to enhance the mining supply, tourism/convention, forestry/silviculture and transportation sectors of the City's economy. Major projects which have the potential to significantly impact the City's economy include:

- continuing work on Alcan's Kemano Completion Project. Considerable work remains to be done on this project;
- proposal by China Steel to locate a major steel mill in British Columbia. The proponent is examining several possible sites in the province, including the Terrace area;

- various mining proposals in the region, including the Mount Klappan coal project (Esso Resources) and several gold mining projects (Dome Mountain, Lawyers, SNIP);

- transportation projects, including a possible highway between Terrace and Telkwa (Telkwa Pass Highway).

.5 Attitudes Toward Growth

The people of Terrace hold a positive attitude towards growth. The history of resource-based industrialization in the Terrace area has provided a strong economic base for the economy as well as made residents accustomed to forestry, mining, energy and related activities. There is also continuing interest in enhancing the tourism, service and related sectors of the City's economy. This interest has grown out of the realization that nearby Kitimat possesses some location advantages for industry (eg: tidewater port, established heavy industry base), and increasing interest in the provision of diversified, environmentally sound growth opportunities for Terrace.

### 5.3.3 Kitsumkalum

The Kitsumkalum Indian Band has three reserves in the Terrace area. None of these reserves fall within the study area. There is, however, interest among members of the Band in participating in activities related to transmission line construction. A number of Band members currently work in Terrace. In addition, Band members also participate in traditional economic activities such as hunting, fishing and wild food gathering.

### 5.3.4 Kitselas

The Kitselas Indian Band has several reserves in the Terrace area. The largest of these reserves, the Kitselas Canyon Indian Reserve No. 1 located northwest of Terrace on the Skeena River, is unoccupied. The Kitselas Indian Reserve No. 6, located immediately south of Terrace on the Skeena River, has a population of 107. This is the only occupied reserve belonging to the Band.

Approximately 50 members of the Kitselas Indian Band are employed in Terrace. Traditional economic activities are important to the Band members, including trapping which takes

place on the Band's trapline in the Onion Lake/Kitimat River area. Twenty Band members recently completed a Canada Employment Centre programme which included instruction in falling, slashing, silviculture and related skills. These people, together with other Band members who have acquired skills and experience in forestry/logging, construction and other activities, may be able to participate in transmission line construction.

### 5.3.5 Lakelse Lake

The most densely settled area between the communities of Terrace and Kitimat is Lakelse Lake. Limited seasonal cottage development existed along the east side of Lakelse Lake prior to the 1950s. Crown subdivisions on the west shore of the lake, during the 1950's, coupled with the establishment of a sawmill and upgrading of the Terrace-Kitimat Highway, brought increased development to the Lakelse Lake area. The 1960's saw not only extensive development around the lake, particularly along the eastern side, but also a change in the type of use from primarily recreational to residential use for people who worked in Kitimat or Terrace. This pattern of use still exists today.

Population estimates obtained from the Kitimat-Stikine Regional District indicate that 250-300 people reside at Lakelse Lake on a permanent basis. This estimate increases substantially during the summer months, when the seasonal cottages surrounding of the lake are occupied. People living at Lakelse Lake work in both Kitimat and Terrace. No information is available to estimate the number of Lakelse Lake residents working at these locations. It is, however, reasonable to assume that these residents are involved principally in primary (logging, forestry), manufacturing (forest products, aluminum, chemicals), trade and service sector activities.

### 5.3.6 Port Simpson Indian Band

The Lakgeas I.R. No. 87 and Lakelse I.R. No. 25 located on the Lakelse River belong to the Port Simpson Indian Band. This Band is centred in the Prince Rupert area. These reserves are summer villages traditionally used by the Band.

## 5.3.7 District of Kitimat

### .1 Population

The District of Kitimat has a population of 11,196 (1987). The City's population declined by 12.9% over the period from 1981-1987. This decline followed a ten year period during which there had been considerable growth in the community.

### .2 Economic Base

The foundation of the Kitimat economy is large scale manufacturing. In the 1950's, the Aluminum Company of Canada (Alcan) built the Kemano power project, located 80 kilometres southeast of Kitimat, as well as the aluminum smelter in Kitimat. Alcan remains the largest employer in this community. Other large scale industrial development in Kitimat included the Eurocan Pulp and Paper Company Mill (1969) and Ocelot Ammonia Company's methanol/ammonia plant (1982). Together, these industries employ over 2,700 people in the community. Other components of Kitimat's economic base include the trade/service, government, tourism, forest harvesting and fishing sectors.

A more detailed assessment of the Kitimat economy is provided in Table 5.3.7. The dominance of the manufacturing sector in the District's economy is quite evident, with over 50% of Kitimat's labour force employed in this sector. The remainder of the District's economy is comprised of activities which provide services to the manufacturing sector and people employed in it, including, in decreasing order of relative importance, service, trade, public administration, transportation/ communication/utilities, and finance and related activities. The primary and construction sectors are not major components of the Kitimat economy, employing 2% and 3% of the labour force, respectively.

TABLE 5.3.7

KITIMAT LABOUR FORCE BY INDUSTRY

| INDUSTRY | PERCENT TOTAL OF LABOUR FORCE |
|---|---|
| Primary | 2 |
| Manufacturing | 52 |
| Construction | 3 |
| Transportation, Communications and Utilities | 5 |
| Trade | 9 |
| Finance, Insurance and Real Estate | 1 |
| Service | 22 |
| Public Administration | 6 |
| TOTAL | 100 |

Source: Census of Canada, 1986

.3 Unemployment and Labour/Contractor Availability

The unemployment rate in Kitimat in October of 1989 was estimated at 5.5%. The following is an indication of the number of workers capable of participating in transmission line construction activities:

- Forestry/logging - 6 workers available;
- Construction trades/ occupations - 56 workers available;
- Equipment operation - 9 workers available;
- Other labour - 111 workers available.

Based on discussions with the Canada Employment Centre in Terrace, fewer contractors with skills and experience which may be relevant to transmission line construction activities are available in Kitimat than in Terrace. The strong orientation of the economy of Kitimat toward large scale manufacturing accounts for this fact. There are, however, a limited number of forestry/logging/ silviculture, heavy equipment, trucking, electrical and general construction/project management firms in Kitimat who may be able to participate in various phases of transmission line construction.

.4 Economic Development Initiatives

The Community Planning and Development Office of the District of Kitimat has targeted large scale industry as the focal point of its economic development efforts. Major projects which have the potential to significantly impact the District's economy include:

- Kitimat Port development. The District of Kitimat has completed concept design studies and a marketing study which indicate that a 12 hectare forest products assembly wharf is a potentially viable development;
- pulp mill expansion, shipping terminal expansion and possible addition of a sawmill by Eurocan Pulp and Paper;
- ongoing expansion and upgrading at the Alcan Smelter, including a $55 million project to construct tilting furnaces and other facilities, and a $300 million modernization program.

In addition, continuing work on the Kemano Completion Project and proposed China Steel facility will have significant impacts on the economy of the District of Kitimat.

.5 Attitudes Toward Growth

The District of Kitimat is favourably disposed to industrial development. Given the fact that the community was created to host such development, this attitude is not surprising. There is, however, considerable interest within the community in ensuring that such growth is diverse in nature and environmentally sensitive.

5.3.8 Kitamaat Village

The Kitamaat Indian Band has several reserves in the vicinity of the District of Kitimat. The Kitamaat Indian Reserve No. 11, located at the entrance to Minette Bay on the Kitimat Arm of the Douglas Channel, contains the most substantial development. Over 580 people live on this reserve, referred to as the Kitamaat Village.

In terms of economic activities, many members of the Kitamaat Indian Band work at the manufacturing industries in Kitimat. Band members also participate in more traditional economic activities such as hunting, trapping and fishing. Discussions with the Band indicate that approximately 20 Band members have skills and experience which may allow them to participate in logging, clearing, slashing and related transmission line construction activities.

5.3.9 Summary

Approximately 23,000 people live in the vicinity of the Skeena and Kitimat substations and along the proposed transmission routes. Manufacturing of resource products, utilizing the region's abundant energy resources, is the basis of the area's economy. Financial and related services, public administration, trade and related services are also significant components of the areas economy. Primary activities (logging, mining) are important to the Terrace economy, yet much less so in Kitimat. The average rate of unemployment is approximately 6%. Among the unemployed is a substantial pool of forestry/logging, construction trades/occupations, equipment operation and other labour which may be able to participate in transmission line construction In addition, various types of contractors with skills and

experience relevant to various phases of transmission line construction are located in the area, principally in Terrace. Economic development initiatives in the area are focussed on enhancing the trade/service sector of the economy and bringing additional heavy industry into the area. The attitudes toward growth in the area appear to be in favour of fostering diversification and strengthening existing industries in an environmentally sound manner.

## 5.4 SOCIAL AND ECONOMIC IMPACTS

### 5.4.1 Introduction

Having reviewed the proposed Skeena-Kitimat 287 kV transmission line project and outlined characteristics of the communities located along the proposed transmission routes, it is now possible to assess the impacts which these communities will feel as a result of transmission line construction. This section describes employment, accommodation, income and other community impacts which are anticipated.

### 5.4.2 Employment

#### .1 Skills Required

The nature of skills required during transmission line construction varies with the phase of construction. As outlined in Section 5.2.3, there are seven distinct phases involved in construction of the proposed Skeena-Kitimat transmission line. The phases which involve the greatest number of specialized skills include surveying/forestry, relocation of the 2L103 line at Kitimat, actual construction of the transmission line and civil construction/electrical installation at the Skeena substation. The phases which involve fewer specialized skills include right-of-way clearing and restoration.

#### .2 B.C. Hydro Hiring and Contracting Policies

The broad policy of B.C. Hydro, which acts as the controlling organization during all phases of construction, is to work toward the maximization of local involvement in hiring and contracting out for transmission line construction. For the proposed Skeena-Kitimat project, B.C. Hydro will undertake ground surveys and relocation of the 2L103 line at Kitimat

themselves, and contract out all other phases of construction. Contractors are required to supply an experienced workforce with appropriately qualified personnel. There are, however, no contractual requirements for the supply of union labour. Prospective contractors must take labour considerations into account when assembling their bids. Ultimately, therefore, the decision of hiring throughout most of the construction process rests with the contractor. However, B.C. Hydro encourages the contractor to utilize local labour resources where possible.

Right-of-way clearing and restoration generally provide the greatest opportunities for local employment. In order to enhance local involvement, B.C. Hydro may further divide such work in order to provide local contractors with limited financial resources a better opportunity to become involved. Local employment opportunities during actual construction of the transmission line are generally available with access road, excavation and service work. For the phases of construction which involve more specialized skills, qualified personnel tend to be drawn from a wider geographic area.

.3 Availability of Labour and Contractors

As discussed in the preceding section, a substantial pool of labour with skills and experience which may be appropriate for transmission line construction exist in the Terrace-Kitimat area. Table 5.4.2 summarizes this information. The job skills held by this pool of labour may be described as follows:

- timber cutting and hauling;
- silviculture, including site clearing and preparation;
- various trades including carpentry, masonry, electrical, welding, etc.;
- heavy equipment operation; and
- miscellaneous occupations including construction labour, small equipment operation, etc.

TABLE 5.4.2

AVAILABILITY OF FORESTRY, CONSTRUCTION, EQUIPMENT OPERATION AND OTHER WORKERS IN THE TERRACE-KITIMAT AREA (October, 1989)

| COMMUNITY | AVAILABILITY OF LABOUR IN VARIOUS OCCUPATIONS | | | | |
|---|---|---|---|---|---|
| | Forestry/ Logging | Construction Trades/ Occupations | Equipment Operation | Other Labour | Tota |
| Terrace | 102 | 137 | 60 | 176 | 475 |
| Kitimat | 6 | 56 | 9 | 111 | 182 |
| TOTAL | 108 | 193 | 69 | 287 | 657 |

Source: Canada Employment Centre

Contractors with abilities and experience relevant to transmission line construction are located in the area. As noted in the preceding section, a relatively greater number of these contractors are located in Terrace than is the case in Kitimat. However, given the short distance between these communities (less than one hour commuting time), this is not considered to be a significant factor in terms of contractor availability. These contractors may be grouped into the following categories:

- forestry/logging and silviculture contractors;
- heavy equipment;
- trucking contractors;
- electrical contractors; and
- general contracting/project management.

From this analysis, it appears that a substantial portion of the workforce required to undertake less specialized transmission line construction activities (eg: right-of-way clearing and restoration) is available in the area. In addition, workers able to undertake various tasks associated with the more specialized phases of construction ( eg: actual construction of the transmission line) are available in the area. It is likely, however, that the contractors and a significant portion of the workforce required to complete these more specialized phase of construction will have to be drawn from outside the Terrace-Kitimat area.

Another significant factor which will affect labour and contractor availability is the success of economic development initiatives, notably major projects employing substantial construction workforces. If the major manufacturing, mining and transportation projects proposed for the area come to fruition and the timing of their construction is coincident with that of the proposed transmission line, labour and contractor availability may be restricted.

.4 Employment Generated

There are two major types of employment generated by construction projects such as the proposed Skeena-Kitimat 287 kV transmission line. They are:

- Direct Employment

  Results from employment generated by construction; and

- Indirect/Induced Employment

  Results from expenditures on goods and services by the project proponent, persons employed in construction and others involved in providing services to the construction industry. The majority of indirect/induced employment associated with construction activities is typically generated in the trade, service and hospitality sectors of the economy.

An indication of the amount of direct employment generated was outlined above in Table 5.2.3. This table showed that the peak workforce during the first two years of construction would be ten people. This figure would rise to approximately 40 people during the right-of-way clearing and transmission line construction phases (1993-1994), prior to falling to 5-10 people during the final phases of construction.

As the amount of indirect/induced employment generated is dependent on the amount of direct employment generated, it follows that the level of indirect/induced employment will be greatest during the right-of-way clearing and transmission line construction phases. However, some indirect/induced employment will also be generated during the phases of construction which employ fewer people.

.5 Workforce Inmigration

The above analysis has shown that a portion of the workforce and contractors required to undertake transmission line construction activities is available in the Terrace-Kitimat area.

Workforce inmigration can therefore be expected in only those phases of construction which require specialized skills (ground surveying, relocation of 2L103 line, actual construction of the transmission line, civil and electrical work at the Skeena substation). Of these phases which required specialized skills, inmigration will be most significant during actual construction of the transmission line, as this phase requires not only a range of special skills (linemen, rock workers, etc.), but also the largest workforce.

### 5.4.3 Accommodation of Workforce

#### .1 Demand for Accommodations

The availability of labour and contractors with appropriate job skills in an area has a direct impact on the need for workforce accommodations. If sufficient labour and contractors are available, little inmigration will take place and therefore few accommodations will be required. Conversely, if an appropriate pool of labour and contractors is not available, considerable inmigration will take place, resulting in the need for accommodations.

Using the workforce inmigration projections derived above, it is possible to comment on the demand for accommodations in the Terrace-Kitimat area. The greatest demand for accommodations will occur during the actual construction of the transmission line, when the largest workforce and most specialized skills are required. Demand for accommodation will also arise during other phases of construction, although such demand will be less significant.

Terrace will act as the principal activity centre for work in the northern portions of the proposed Routes, while Kitimat will act as the centre for work on the proposed Routes' southern halves. Work on the Skeena substation will be based out of Terrace. Given the proximity of Terrace and Kitimat and the fact that they are linked by a paved highway, construction crews will be able to commute easily from either centre to work sites along the proposed routes.

The type of accommodation required to house inmigrant workers would be of a short term nature. The multi-phased nature of transmission line construction translates into the need for hotel/motel, housekeeping cabin, recreation vehicle or construction camp accommodations used by a succession of crews, each staying for a relatively short period (eg: 1-6 months).

.2 B.C. Hydro Workforce Accommodation Policy

B.C. Hydro encourages the use of facilities available in local communities in order to accommodate construction workforces. When local accommodation is insufficient or not suitably located, construction camps are provided. It is not expected that construction camps will be required to accommodate workforces involved in the proposed Skeena-Kitimat project. Although the decision of workforce accommodation is ultimately the responsibility of the contractor undertaking the work for B.C. Hydro, these contractors are encouraged to utilize accommodations, restaurants and other amenities available in local communities to the greatest extent possible.

.3 Availability of Accommodations

Table 5.4.3 provides a summary of available accommodations in the Terrace-Kitimat area. It is not only apparent that sufficient accommodations are available in this area, but that these accommodations are located within reasonable commuting distance of construction sites.

Contractors proposing to use local accommodations must give consideration to booking these accommodations well in advance, providing the proprietor with an indication of work scheduling to allow staffing adjustments, meal preparation and so forth, and ensuring that other guests using these accommodations are respected. This will not only allow crews to be well taken care of, but will assist in providing greatest economic benefit to the proprietor and the community.

TABLE 5.4.3

AVAILABLE ACCOMMODATIONS IN THE TERRACE-KITIMAT AREA

| COMMUNITY | HOTEL/MOTEL/ RESORT UNITS | RECREATION VEHICLE SITES | TOTAL UNITS/ SITES |
|---|---|---|---|
| Terrace | 387 | 94 | 481 |
| Lakelse Lake | 32 | 22 | 54 |
| Kitimat | 24 | 60 | 84 |
| TOTAL | 443 | 176 | 619 |

Source: B.C. Ministry of Tourism and Provincial Secretary, Accommodation Guide (1989).

### 5.4.4 Income

#### .1 Nature of Income

The nature of transmission line construction projects provides two main sources of income to local communities. These are:

- **Wages**

  Direct wages earned by those participating in construction, together with indirect/induced wages earned by those whose jobs were generated as a result of construction; and

- **Materials**

  A variety of goods will be purchased in local communities, ranging from food to gas/oil to construction materials.

#### .2 B.C. Hydro Spending and Purchasing Policies

There are also two main components of B.C. Hydro spending and purchasing policies which are directly relevant to the income effects of transmission line construction. These are:

- **Wages**

  As B.C. Hydro encourages local hiring, it follows that the extent of wages earned by persons living in local communities be maximized; and

- **Materials**

  B.C. Hydro's purchasing policy emphasizes that B.C. suppliers be considered first, followed by suppliers in other parts of Canada, and, finally, international suppliers. The intent of this policy is to ensure that local communities benefit to the greatest possible extent from material purchases for transmission line construction.

.3 Availability of Materials

The types of supplies required by a project of this nature may be separated into two broad categories:

- Basic Materials

  Food, personal items, gas and oil and hardware are examples of basic materials which will be required through all phases of construction; and

- Construction Materials

  There is considerable variation in the types of materials required for a transmission line construction project. These range from chain saws to brush clearing equipment to custom steel products to special types of conductors.

Given the nature of supplies required, it is possible to comment on the availability of these supplies in the Terrace-Kitimat area. Basic supplies (eg: food, personal items) are available in the area. Construction materials required during less specialized phases of construction (eg: logging and clearing) are also available in the area. In addition, there may be an opportunity to supply wooden poles to support conductors. The provision of such poles is a well-established industry in Terrace. However, the more specialized products required during the later phases of construction are likely not available in the area. It is probable that the custom steel products and conductors will have to be brought in from a wider geographic area.

.4 Income Effects

The above analysis allows comments to be made with respect to what income effects may be anticipated as a result of the construction of the proposed Skeena-Kitimat 287 kV transmission line. These comments are organized under headings which reflect the two main sources of income in local communities - wages and materials.

- Wages

  Greatest benefit will be derived from direct wages during those phases of construction which require less specialized skills and, therefore, when local labour participation is highest. As the tasks involved in transmission line construction become progressively more specialized, leading to greater

inmigration of workers, relatively less income benefits will be derived from direct wages. Income resulting from indirect/induced wages will also be greater during those phases of construction which require less specialized skills. The fluctuation in this form of income will not be as pronounced as is the case with direct wages, however. This is due to the fact that those employed directly in construction will continue to require goods and services from he local area regardless of whether they are permanent or temporary residents.

. Materials

Local communities will also derive greatest income benefits from the purchase of construction materials during those phases of construction which require less specialized skills and materials, as most of these materials will be available locally. Although basic supplies will continue to be purchased in the area during those phases of construction requiring more specialized skills and equipment, materials such as steel, conductors and so forth will not. This will lead to a relatively lower level of income benefits accruing to the local area during the more specialized phases of construction.

5.4.5 Community Impacts

Several issues and concerns which are relevant to the potential social and economic impacts of the proposed project were raised by people living in the Terrace-Kitimat area. These issues and concerns are summarized below:

.1 Local Employment Opportunities

The issue of provision of local employment opportunities was raised in both Terrace and Kitimat, as well as by each of the Indian Bands consulted. These sought-after opportunities included not only direct employment in construction, but also indirect/induced opportunities associated with construction support services.

A closely related issue which was raised is the need to provide training, advice and assistance to local communities to enhance the possibility of securing direct employment in transmission line construction. Such assistance is particularly important to Indian Bands, as it would provide them with a better understanding of what equipment and manpower prospective contractors would require, how the tendering process will work, what the project schedule would be, and other important factors.

.2 Long Term Benefits to the Local Area

There is interest in the local area regarding the provision of long term benefits associated with this and other Hydro projects. Such benefits may include opportunities to participate in ongoing maintenance of the proposed transmission line (eg: brush clearing) as well as training programs to allow area citizens to participate in future B.C. Hydro initiatives in the area.

.3 Size of Construction Contracts

Forestry, silviculture, construction and other firms in the area have raised the issue of the size of construction contracts. Large contracts require not only extensive capital and manpower resources, but also bonding which may be beyond the reach of a small firm. In order that local firms are able to bid on these construction contracts, they hope that such contracts will be in the $100,00 - $200,00 range. While this may not be practical in some stages of construction, consideration of this request wherever possible will do much to enhance local economic benefits.

5.4.6 Summary

The key employment, accommodation, income and other community impacts associated with the proposed Skeena-Kitimat 287 kV transmission line project are summarized below.

Direct employment during the peak of the ground surveying and line relocation phases of construction, projected to take place between 1991-1992, will be in the order of ten positions. The level of direct employment during the right-of-way clearing and transmission line phases of

construction will rise to approximately 40. These phase are projected to occur between 1993-1994. Alterations to the Skeena substation and restoration of the right-of-way, scheduled to take place between 1994-1995, will employ a peak workforce of 5-10 people. Indirect/induced employment generated will mirror these trends, with the greatest amount of such employment occurring during the right-of-way clearing and transmission line construction phases. As a considerable portion of the required workforce is available in the area, substantial inmigration can be expected only during those phases of construction which require specialized labour and contractors.

The use of local hotel/motel, recreation vehicle site and other accommodations will be greatest during those phases of construction requiring specialized labour and contractors, as this workforce will be drawn from outside of the area. Ample accommodations exist in the area to house this inmigrant workforce. In addition, these accommodations are located within reasonable commuting distance of all work sites along the proposed transmission routes. Therefore, the need for construction camps is not anticipated.

There are two major components of income effects associated with a project of this nature - wages earned from direct and indirect/induced participation in the project, and expenditures on materials. The local area will derive greatest benefit from direct and indirect/induced wages during less specialized phases of construction, when local labour participation is highest. The local area will also realize the most substantial income effects from the purchase of construction and other materials during the less specialized phases of construction, when most required materials are available locally.

A number of socio-economic issues have been raised by people living in the Terrace-Kitimat area. These include the desire to secure local employment opportunities, the possibility of bringing long term benefits to the area and the need to ensure that construction contracts are of a size manageable by small firms. B.C. Hydro should be aware of these issues in order that local benefits may be maximized.

Construction projects such as that proposed by B.C. Hydro are transitory in nature. It follows, therefore, that any socio-economic benefits associated with this proposed project will also be transitory in nature. Furthermore, the magnitude of the construction workforce for the proposed project is not large in the context of the overall labour

force in the Terrace-Kitimat area. There are, however, opportunities for the area to benefit from the income effects (wages and material purchases) of the proposed project. It is therefore important that B.C. Hydro, its contractors and the local communities work closely together to ensure maximum economic benefits accrue to the local area during construction, and that disruptions to community life are minimized.

# APPENDIX I

## INFORMATION SOURCES AND CONTACTS

## 1. EXISTING MAP SERIES

### .1 B.C. Ministry of Crown Lands 1:20,000 Map Series

- Terrace-Kitimat Area, Maps F1031.007, .008, .017, .018, .027, .028, .037, .038, .047, .048.

### .2 B.C. Ministry of Environment 1:250,000 Map Series

- Prince Rupert-Terrace, Map 1031

### .3 B.C. Ministry of Environment Water Rights Map

- Smithers Regional Office

### .4 Various Other Provincial Government Agency Mapping

- Agricultural Land Reserves (Agricultural Land Commission);
- Registered Traplines (Ministry of Environment, Fish and Wildlife Branch);
- Kitimat-Terrace Road System (Ministry of Transportation and Highways, Planning Branch).

## 2. PUBLISHED INFORMATION

### .1 Kitimat-Stikine Regional District

- Zoning Bylaw No. 57 (Lakelse Lake);
- Greater Terrace Area Official Settlement Plan, Background Report and Recommendations.

### .2 District of Kitimat

- District of Kitimat Zoning Bylaw No. 818;
- District of Kitimat Official Community Plan.

3. **MUNICIPAL GOVERNMENT**

.1 City of Terrace

- Mr. Marvin Kamenz - City Planner
- Mr. Peter Monteith - Economic Development Officer

.2 District of Kitimat

- Mr. Brian Mayhew - Director of Community Planning and Development
- Ms. Gwendolyn Sewell - Planner

4. **REGIONAL GOVERNMENT**

.1 Kitimat-Stikine Regional District

- Mr. Tosh Yamashita - Planner

5. **INDIAN BANDS**

.1 Kitsumkalum Indian Band

- Mr. Cliff Bolton - Band Manager

.2 Kitselas Indian Band

- Mr. Mel Bevan - Chief/Band Manager

.3 Kitamaat Indian Band

- Mr. Ken Hodgins - Director of Administration

6. **PROVINCIAL GOVERNMENT AGENCIES**

.1 Ministry of Crown Lands (Smithers)

- Mr. Ed Opal - Manager, Development and Marketing
- Ms. Kathy Wagar - Status Clerk

.2 Ministry of Environment (Smithers)

. Ms. Karen Diemert - Water Management Branch

.3 Ministry of Transportation and Highways (Smithers)

. Mr. Dirk Nyland - Manager, Technical Services

7. CANADA EMPLOYMENT CENTRE

. Mr. James Gilham - Labour Market Information Analyst, Terrace Office

8. OTHER

. Mr. Dennis Towriss - Pacific Northern Gas

. B.C. Ministry of Tourism and Provincial Secretary, Accommodations Guide (1989)

. Indian and Northern Affairs Canada, Northwest District Office

# APPENDIX II

## LIST OF WATER LICENCES ALONG THE PROPOSED SKEENA-KITIMAT TRANSMISSION ROUTES

1. **PROPOSED ROUTE 'A'**

| SOURCE | LICENCEE | AMOUNT | USE |
|---|---|---|---|
| Lakelse Lake | Ministry of Environment | 40,000 GD | WWK |
| | Eide, K. | 500 GD | DOM |
| | Classen, V. | 500 GD | DOM |
| | Kline, R. | 500 GD | DOM |
| | Slalker, J. | 500 GD | DOM |
| | Diahorad, K. | 500 GD | DOM |
| | Dept. of Fisheries & Oceans | N/A | CON |
| Williams Creek | Dept. of Fisheries & Oceans | N/A | CON |
| Cole Creek | A. & A. Trading Ltd. | 1,000 GD | DOM |
| | | 3 AF | IRR |
| Keynes Creek | Begen, C. | 500 GD | DOM |
| | Colongard, P. | 500 GD | DOM |
| Wylie Creek | Kerr, S. | 500 GD | DOM |
| Sparkes Creek | Sparkes, M. | 500 GD | DOM |
| Hatchery Creek | | | |
| . Smith Outlet | McKay, B. | 500 GD | DOM |
| | Sandhals, J. | 500 GD | DOM |
| . North Outlet | Morrison, N. | 500 GD | DOM |
| | Hjolmes, D. | 1,000 GD | DOM |
| | Ballinger, W. | 500 GD | DOM |
| | Morris, N. | 500 GD | DOM |
| | Piffer, H. | 500 GD | DOM |

LEGEND: GD = Gallons/Day
AF = Acre Feet
CS = Cubic Feet/Second
DOM = Domestic
WWK = Waterworks
CON = Conservation
IRR = Irrigation
STO = Storage
LIM = Land Improvement
MTR = Mineral Trading
IND = Industrial

cont'd.

1. PROPOSED ROUTE 'A' (cont'd.)

| SOURCE | LICENCEE | AMOUNT | USE |
|---|---|---|---|
| Hatchery Creek<br>. South Outlet | Currie, J.<br>Piffer, V. | 500 GD<br>1,000 GD | DOM<br>DOM |
| McColl Brook | Brown, L. | 500 GD | DOM |
| Gainie Creek | Johnston, L. | 1,500 GD | DOM |
| Jevons Creek | Johnston, B. | 500 GD | DOM |
| Creech Creek | Ritchie, A.<br>Morrison, R. | 1,500 GD<br>500 GD | DOM<br>DOM |
| Martinson Creek | Triple E Holdings Ltd. | 500 GD | DOM |
| Morgan Brook | McCrae, M. | 500 GD | DOM |
| Edward Creek | Sarich, J.<br>Cassidy, J.<br>Wahl, V. | 1,000 GD<br>500 GD<br>500 GD | DOM<br>DOM<br>DOM |
| Crystal Creek | Stromdahl, R.<br>Irvine, J.<br>Kerbrat, M.<br>Place, C. | 500 GD<br>500 GD<br>500 GD<br>500 GD | DOM<br>DOM<br>DOM<br>DOM |
| Ashley Manor Creek | Tugwood, G.<br>Tugwood, G.<br>Boyle, F. | 1,000 GD<br>N/A<br>500 GD | DOM<br>STO<br>DOM |

1. PROPOSED ROUTE 'A' (cont'd.)

| SOURCE | LICENCEE | AMOUNT | USE |
|---|---|---|---|
| Moutain Creek | Mount Layton Hot Springs | 60,000 GD | IND |
| Garand Creek/ Gamelin Creek | Mount Layton Hot Springs | N/A | LIM |
| Lakelse Hot Springs | Mount Layton Hot Springs | 54,000 GD<br>150,000 GD | MTR<br>MTR |
| Schulbuckhand Creek | Dept. of Fisheries & Oceans | 1,000 GD | CON |

2. PROPOSED ROUTE 'B'

No licenced water sources.

3. PROPOSED ROUTE 'AB'

| SOURCE | LICENCEE | AMOUNT | USE |
|---|---|---|---|
| Kitimat River | Kentron Construction Ltd. | 25.000 GD | IND |
| Anderson Creek | Alcan Ltd. | 20 CS | IND |
| | Eurocan Pulp & Paper Co. | 5,000 GD<br>0.26 CS | WWK<br>IND |

MAPS
NOT
FILMED

CARTES
OMISES